The Single Market Review

EUROPE

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Volume 6:

Motor vehicles

The Single Market Review

IMPACT ON MANUFACTURING

MOTOR VEHICLES

The Single Market Review series

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EUROPEAN COMMISSION

The Single Market Review

IMPACT ON MANUFACTURING

MOTOR VEHICLES

The Single Market Review

SUBSERIES I: VOLUME 6

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This report is part of a series of 39 studies commissioned from independent consultants in the context of a major review of the single market. The 1996 Single Market Review responds to a 1992 Council of Ministers Resolution calling on the European Commission to present an overall analysis of the effectiveness of measures taken in creating the single market. This review, which assesses the progress made in implementing the single market programme, was coordinated by the Directorate-General 'Internal Market and Financial Services' (DG XV) and the Directorate-General 'Economic and Financial Affairs' (DG II) of the European Commission.

This document was prepared for the European Commission

by

Ernst & Young

It does not, however, express the Commission's official views. Whilst every reasonable effort has been made to provide accurate information in regard to the subject matter covered, the Consultants are not responsible for any remaining errors. All recommendations are made by the Consultants for the purpose of discussion. Neither the Commission nor the Consultants accept liability for the consequences of actions taken on the basis of the information contained herein.

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Table of contents

List of tables

List of figures

List of abbreviations and terms

CAD/CAM	Computer aided design/computer aided manufacturing
Counterfactual	If the industry has suffered a decline in certain areas, then the policy may have still improved the position, which would have been worse without the policy.
E&Y	Ernst & Young
EDI	Electronic Data Interchange
ERM	Exchange Rate Mechanism
FDI	Foreign direct investment
GATT	General Agreement on Tariffs and Trade (UN)
GM	General Motors
HHI	Hirschman-Herfindahl Index
ICT	Information and Communications Technologies
IMVP	International Motor Vehicle Programme
JIT	Just In Time
MPV	Multi-purpose vehicle
NAFTA	North American Free Trade Agreement
National market	The market from which the producer or main shareholder originates. For example, VAG's national market, despite production in many other Member States such as at its Seat plant in Spain, is Germany.
OEM	Original Equipment Manufacturer
PSA	Peugeot-Citroën Group
Rational expectations	People will act on expected policy changes (and the policy's likely changes) well before the policy is implemented. This smoothes out the impact of the policy.
RD&D	Research, design and development
SMP	Single market programme
VAG	Volkswagen Audi Group
WTO	World Trade Organization

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1. Summary

1.1. Scope and approach

This study considers the effects of the single market programme on the motor vehicles sector. The scope of the study includes car and truck manufacturers in the European Union (EU) but excludes agricultural vehicles, construction vehicles and two- and three-wheeled vehicles. The primary focus is on motor vehicle assemblers, with the impact of the single market programme on component suppliers being examined in terms of the changes in sourcing, outsourcing and procurement patterns of the assemblers.

The objectives of this study are to investigate the extent to which the various sector-specific single market measures, such as the establishment of whole vehicle and component type approval, safety regulations and environmental controls, have affected the EU automotive sector. In addition to these sector-specific measures, we have also considered the horizontal single market measures which affect the EU automotive sector, such as the liberalization of cross-border transport through the abolition of frontier controls. As important as the measures, we have also taken account of the higher importance given to conducting business on a pan-European basis, which resulted from the 'marketing' of the single market.

Our assessment of the effects of these measures on the EU automotive sector includes an in-depth consideration of the 'other' explanatory factors which might also have an effect on the sector. We have categorized the other factors affecting the industry as follows:

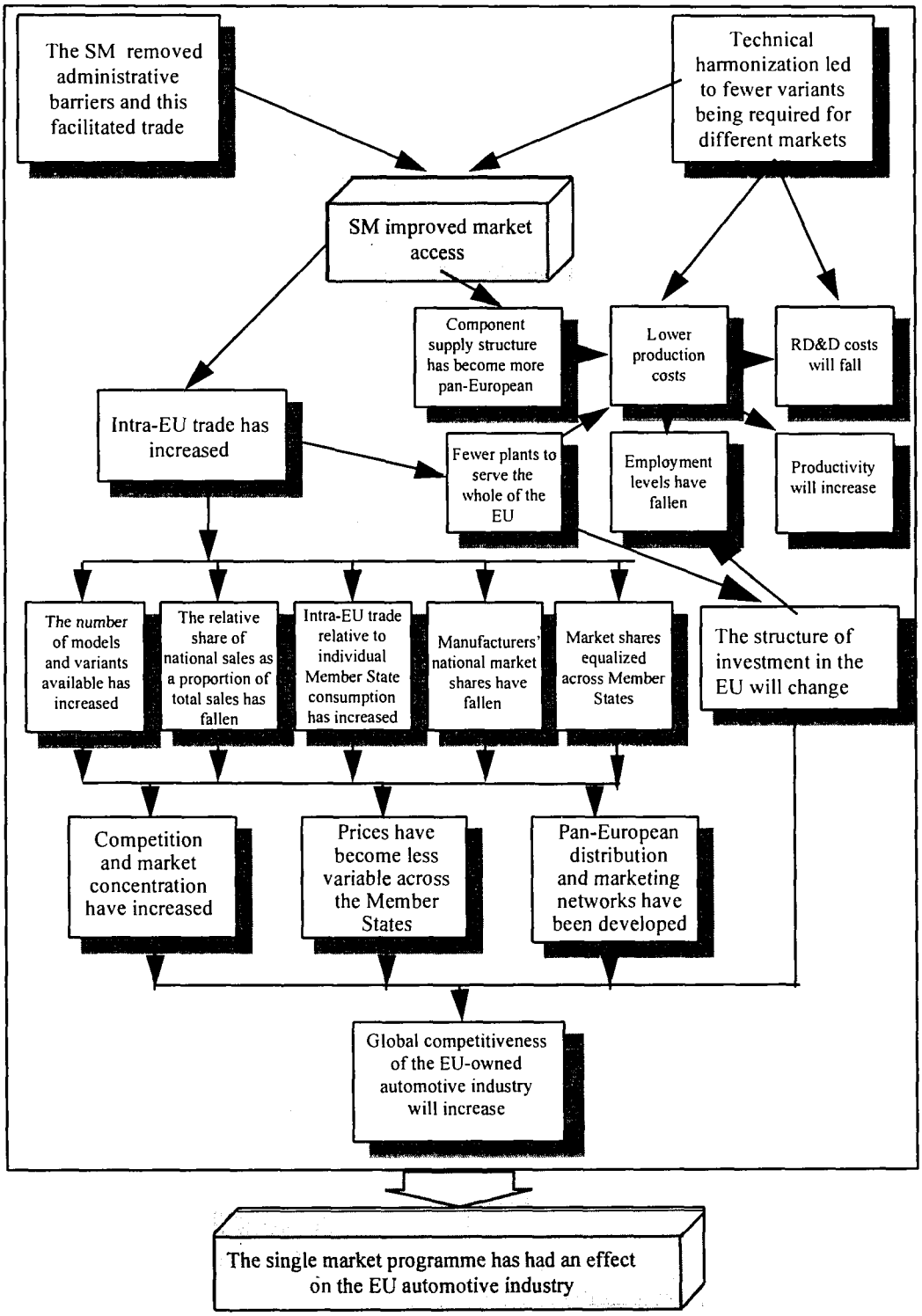
(a) market conditions;
(b) German reunification;
(c) new model launches;
(d) globalization;
(e) currency fluctuations;
(f) over-capacity;
(g) low returns;
(h) production and supply chain changes;
(i) research initiatives and technological change;
(j) environmental issues.

A 'hierarchy of hypotheses' helps to distinguish between the effects of the sector-specific measures and the horizontal measures of the single market as well as the other factors. The hierarchy of hypotheses is illustrated in Figure 1.1. This hierarchy allows a clear assessment of each of the expected impacts of the single market programme on the automotive sector. The effects of all of the various single market measures and the other factors on the EU automotive sector can be assessed. Finding some measurable effect in one of the hypotheses will not in itself prove that the single market programme has had an effect. However, if it is found that the single market programme has had a measurable effect for a number of the hypotheses, the claim that the single market programme has had an effect on the sector becomes more robust.

Each hypothesis includes significant levels of quantitative desk research, complemented by a number of detailed case studies with Volvo, Nissan, Fiat, Renault and Daewoo, ascertaining

the companies' views of the impact of the single market programme and what further measures are necessary to finalize the single market.

Figure 1.1. The hierarchy of hypotheses



Interviews with other motor vehicle manufacturers, component manufacturers, experts involved in vehicle testing, Commission officials responsible for technical regulation in the car sector, consumer groups, trade bodies and academic researchers complemented the analysis and case study evidence for each of the hypotheses.

1.2. Key results on the effects of the single market programme

Analysis of intra-EU trade, the number of models and makes available to consumers in different Member States and manufacturers' share of national markets establish the impact of the single market programme on market access. On the whole, the single market programme is having a small measurable effect on market access. Other factors such as the globalization of competition, the economic cycle, currency fluctuations and new product launches are all also having an effect on market access. Importantly, the implementation of the single market appears to be of greater benefit to new entrants into the EU market, particularly the Japanese and Korean automotive manufacturers. The single market allows a clearer entry strategy for these manufacturers.

The single market programme is having a small effect on the level of market concentration in the EU automotive sector. There are indications of growing market strength among the top automotive producers, although market conditions are also having an effect. Profitability in the sector is falling, although this is largely because of over-capacity in the automotive sector brought on by the recent decline in the economic cycle. The single market is having little clear effect on the level of prices for vehicles across the EU. The single market programme was expected to reduce the differences in price for the same product across the Member States. However, the variance of prices across the EU Member States is actually increasing slightly.

Pan-European marketing networks are developing primarily as a result of the single market programme. The structure of distribution is not changing. The block exemption is one of the more dominant factors affecting distribution.

The single market programme seems to be having little direct effect on production costs, although it may be reinforcing recent falls in production costs. Production, supply and technology changes are greater influences on production costs. Similarly, EU automotive manufacturer productivity has improved, but this is more as a result of a continued long-term trend which began well before single market programme implementation.

Employment in the EU automotive sector is falling, although this is more as a result of the recent decline in the economic cycle than of the single market. Cross-border mobility of employment appears to be increasing, albeit slowly. The more important change in employment in the EU automotive sector is the increase in employee flexibility on the shop floor, moving away from previous drives towards capital intensive methods of production.

The single market programme is playing a part in recent changes in the structure of investment by EU automotive manufacturers. Investment in peripheral EU and non-EU regions has been facilitated by the single market programme and there is a greater tendency for the EU automotive manufacturers to enter strategic alliances. However, the increasing globalization of competition and state aids are also important factors changing the structure of investment in the EU automotive industry. The single market programme is affecting the structure of supply of the component suppliers along with new production and supply chain techniques.

The most notable effect of the single market programme has been through the costs in research, design and development. Large cost savings through RD&D have been a result of the single market programme harmonization of whole vehicle type approval across the EU Member States. Direct cost savings are in the order of ECU 1 million, per major new model, and indirect cost savings may be an order of magnitude greater.

As a result of these various impacts, the single market programme is probably having an effect on the global competitiveness of the EU automotive industry, with EU manufacturers' share of the global market increasing.

1.3. Key conclusions

The single market programme has contributed to the ongoing development of the EU motor vehicles sector at a time when it was undergoing important changes in terms of increased globalization, improved working methods and a deep recession. The single market is not making companies expand into new markets, but certainly helped this process by making it easier and cheaper for them to do so. The thrust of the single market measures was therefore in the right direction, but it did not radically alter business strategies.

The single market programme has made it easier for new entrants to compete on equal terms with indigenous EU producers, and this has increased the levels of competition in the sector. This has provided further incentives for companies to decrease costs and increase product differentiation, placing downward pressure on prices and increasing customer service levels. Consumers, therefore, have benefited from the single market programme as a result of the increased choice of products available, increased safety and lower emissions.

1.4. Future actions required

We consider that the European Commission should consider putting forward policies (and monitoring carefully existing policies) which address the following issues:

(a) remaining differences in vehicle tax structures between the Member States which impose large variant costs on producers, affect RD&D and can affect the distribution decisions of specialist marque producers;
(b) variations and differences in exchange rates affecting location, purchasing and distribution decisions of manufacturers and imposing difficulties for the more nationally focused manufacturers who have difficulty 'laying off' exchange rate risks;
(c) remaining differences between the standards set within the EU and the other major global competitor markets such as the US, Japan and newly industrialized countries in the Far East;
(d) different internal standards set by the manufacturers for component suppliers, although progress is being made in this area with the mutual recognition of supplier evaluations by German, French and Italian manufacturers;
(e) differences in the administration of registration between the Member States.

There are also two factors which we believe may be impeding economically efficient rationalization of the industry:

(a) the definition of the relevant market in competition investigations where national pressures can prevent economically efficient restructuring on a pan-European basis;
(b) the effect of state aids provided by Member States supporting the continuance of too many small, nationally orientated, EU-owned players compared with the larger, economically more efficient competitors in the North American and Japanese markets.

2. Introduction

2.1. Overview of the study

On 1 January 1993, the European Union (EU) celebrated the completion of the single market programme. Many initiatives had been undertaken, but it was also realized that not all barriers had been removed. This led to a decision at the 1992 Edinburgh Summit (Council Resolution 92/1218) calling for an overall analysis of the effectiveness of the measures taken to complete the single market programme.

To provide this analysis, the European Commission has commissioned 20 studies covering a range of sectors to investigate the effects of the single market programme and to assess whether obstacles to open competition across borders are still in place. This study is one of those 20 projects. Its scope covers the automotive sector and includes car and truck manufacturers in the EU, but excludes agricultural vehicles, construction vehicles and two- and three-wheeled vehicles. The primary focus is on motor vehicle assemblers, with the impact of the single market programme on component suppliers being examined in terms of the changes in sourcing and procurement patterns of the assemblers.

2.2. Objectives

The objectives of this study are to investigate the extent to which the various single market programme measures affecting the European motor vehicles industry have resulted in:

(a) the removal of barriers to trade and the development of true European economic integration in the motor vehicles sector;
(b) increased competitiveness of European manufacturers in the global motor vehicles market.

More specifically, we include in our analysis four key areas:

(a) barriers to trade – the extent to which the legislative and administrative actions taken to implement the single market have eliminated the barriers to trade in the motor vehicles industry;
(b) cost impacts – the extent to which measures taken to liberalize intra-Community trade and competition have had a direct impact on the costs for motor vehicle manufacturers in Member States;
(c) sectoral analysis – the extent to which measures taken to complete the single market have impacted motor vehicles sector evolution and are now reflected in the structure of the motor vehicles market;
(d) business strategy – analysis of corporate behaviour and strategic responses within the motor vehicles sector to the single market to determine its importance in influencing corporate strategy.

2.3. The report

This report provides a comprehensive analysis of the quantitative data relating to the industry. For example, we have produced an in-depth analysis of market shares, trade flows, levels of industry concentration and financial performance. We have also carried out five case studies

with vehicle manufacturers (Fiat, Renault, Volvo, Nissan and Daewoo). These provide more qualitative interpretative information. They are contained in the appendices, but key elements have been incorporated into the main report. We have finalized mini-case studies on three component supply sectors and the results of these are included in Appendix K. We have also carried out a number of interviews with industry experts.

2.4. Structure of the report

The structure of this report is designed to provide a full description of our preliminary analysis and findings, whilst retaining much of the background detail in the appendices.

Chapter 3 describes the single market measures which are relevant for the automotive sector. In this chapter we provide not only a description of the measures in place, but also a contextual overview of the reasons for regulation and the benefits of European as opposed to Member State intervention in this area.

Chapter 4 reviews our methodological approach and introduces the concept that hypotheses relating to the single market are linked.

Chapters 5 to 7 cover the impact of the single market programme on sectoral performance. It includes our quantitative analysis of the industry and relates our results to the hypotheses specified in Chapter 4.

These three chapters form the heart of our analysis. The impact on the marketing process is covered in Chapter 5. We have covered this in a separate section because it encompasses a wide range of different variables (from prices to market shares) and we have collected and analysed a significant amount of data in this area. Chapter 6 describes the main changes taking place in the other functional areas of automotive assemblers (RD&D, purchasing and production). In Chapter 7 we examine the impact of the single market programme on the global competitiveness of the EU-owned automotive manufacturers, which forms our final hypothesis.

Chapter 8 describes in more qualitative terms our views on the impact of the single market on business strategy. This includes key elements of our case studies covering vehicle manufacturers' business responses.

Chapter 9 presents summaries of findings from the case studies which are presented in greater detail in the appendices. Chapter 10 presents our final conclusions, in which we summarize our views on the actual impact of the single market programme and provide our views on possible policy actions.

We present much of the background data and analysis in the appendices, which are categorized according to the subject matter of each chapter. For example, they contain more detailed information on market shares, component suppliers, EU fiscal regimes and strategic alliances.

3. Assessment of single market legislation

3.1. Types of legislation

This chapter describes the various types of European legislation associated with the single market programme which have affected the EU automotive industry. There are several categories of legislation which need to be considered, including sector-specific and horizontal measures which are part of the single market programme, as well as some non-single-market policies which significantly affect the automotive industry. Each of these different categories need to be considered in the analysis throughout this report.

The chapter begins by describing the reasons behind the implementation of the single market measures. We then describe the actual sector-specific and horizontal measures and their expected impact. Any remaining EU legislation which affects the automotive sector but is not part of the single market programme is then considered. Finally, we provide an overview of the remaining obstacles and/or shortcomings affecting the development of the single market in the automotive sector.

The various categories of legislation can be described in different levels of detail. In this chapter, we concentrate on the key groupings and provide greater detail in Appendices A to C.

3.1.1. The single market measures

The single market measures we analyse are split between sector-specific and horizontal legislation. The sector-specific measures of the single market relate to legislation directly imposed on the automotive sector, such as the harmonization of standards across the EU Member States. The horizontal measures relate to legislation imposed by the EC to help the development of the single market for all sectors. Naturally, these measures will have an effect on the automotive sector. We consider the sector-specific and horizontal measures in turn by first looking at the reasons behind their implementation, then considering the expected impact of the legislation.

Sector-specific measures

The sector-specific measures focus on differences in automotive sector legislation on a country-by-country basis. Country-specific, as opposed to EU-wide policies, affect automotive manufacturers' ability to access the EU marketplace. Different national technical standards to improve the safety of vehicles, restrict their weights and dimensions or limit their emissions result in different variants of cars being necessary for each country market. The costs of variants can be very significant and this increases the costs of entering different markets and leads to a sub-optimal industry structure. In addition, the process of gaining approval to sell new models of vehicles in each Member State traditionally requires the granting of type approval for the whole vehicle. This is a lengthy process, particularly if there are different requirements in each Member State. All these requirements impose extra costs on manufacturers.

This process of technical harmonization for vehicles began well before the single market was conceived and whilst the later measures became incorporated into the single market programme, these must be seen as the final (but critical) measures in a long cycle of

harmonization. Table 3.1 shows the sector-specific measures which are often considered as the single market part of this harmonization process.

Table 3.1. Sector-specific measures

Title	Measure	Description
Whole Vehicle Type Approval	92/53/EEC of 18 June 1992 (latest amendment)	Type approval is carried out by one MS which provides a certificate which is valid in all MSs
Roadworthiness test	94/23/EC of 8 June 1994 (latest)	States that MSs must carry out periodic roadworthiness tests and provide a certificate proving that they have done so
Mechanical coupling devices	94/20/EC of 30 May 1994	Part of the type approval regime. States that coupling devices must conform to certain standards
Lateral protection for goods vehicles	89/297/EEC of 13 April 1989	Provides technical requirements for side protection of heavy goods vehicles and their trailers
Weights and dimensions (cars)	92/21/EEC of 31 March 1992	Harmonizes national laws concerning the weights and dimensions of cars. Covers maximum dimensions, weights and towed weight
Interior fittings	91/662/EEC of 6 December 1991	Harmonizes the technical requirements for the behaviour of the steering device in an impact
Tyres	92/23/EEC of 31 March 1992	Harmonizes national type approval for tyres and their fitting
Tyre pressure gauges	86/217/EEC of 26 May 1986	Harmonizes national provisions relating to tyre pressure gauges in order to facilitate trade
Safety glass and glazing materials	92/22/EEC of 31 March 1992	Brings into line national provisions and relates to type approval in terms of materials used and their installation
Motor vehicle noise	92/97/EEC of 10 November 1992 (latest)	Lays down limits on the noise level of the mechanical parts and exhaust systems
Air pollution: passenger cars	94/12/EC of 23 March 1994 (latest)	Establishes limit values for emissions from cars
Emission of gaseous pollutants from diesel engines	91/542/EEC of 1 October 1991 (latest)	Technical requirements for diesel engines to combat air pollution
Sulphur content of certain liquid fuels	93/12/EEC of 23 March 1993	Limits the sulphur content of gasoline and kerosene (derogation for Greece until 1999)
Spray-suppression devices	91/226/EEC of 27 March 1991	Harmonizes the type approval procedures for spray-suppression devices
Road vehicles: weights and dimensions	92/7/EEC of 10 February 1992	Lays down maximum weights and dimensions for large vehicles
Speed limitation devices for heavy goods vehicles and coaches	92/24/EEC of 31 March 1992	Limits the maximum speed for heavy vehicles used to carry goods or passengers
Speed limitation devices for commercial vehicles	92/6/EEC of 10 February 1992	Limits maximum speed of commercial vehicles
External projections on cabs of commercial vehicles	92/114/EEC of 17 December 1992	Relates to the external projections forward of the cab's rear panel

The sector-specific measures have been developed to ensure that vehicles developed for one Member State are compatible with those required in another. Primarily, this has been achieved through setting technical standards.[1]

The system is complex. In broad terms, it covers three areas:

(a) In terms of harmonizing safety requirements for vehicles, the type approval regime is almost complete. Since 1970, some 45 separate directives harmonizing requirements for different product components have been put in place. Up until 1996, Member States still had to approve the whole vehicle. To do this, manufacturers referred to the standards for specific components which have been covered by the directives and this procedure was carried out by each country where the vehicle was sold. To overcome this barrier, the concept of a European Whole Vehicle Type Approval was developed which ensures that the approval of a new car in one Member State is automatically valid in all Member States. The Whole Vehicle Type Approval applies to new models of cars from 1 January 1996 and to existing models of cars from 1 January 1998. In terms of roadworthiness, a directive is now in force requiring in-service testing for all Member States. However, Member States have considerable latitude in how this is applied and a number of countries have transitional periods (until 1998) to put these procedures into place.

(b) Harmonization of limits on the weights and dimensions of cars is now complete. However, the harmonization of weights and dimensions for trucks has been delayed as a result of the higher maximum limits current in the newly acceding countries of Sweden and Finland.

(c) The EU has put in place measures to limit the levels of pollutants from vehicles. These lay down different limit values for emissions from petrol and diesel vehicles. They cover carbon monoxide, unburned hydrocarbons, nitrogen oxides from petrol and diesel engines; and specifically for diesel engines, limit values for particulate pollutants. Different levels of standards for heavy vehicles have been set over time (Euro 1, 2 and 3). The European Commission is also currently examining a proposal for a common strategy on vehicle scrapping (End of Life Vehicles).

The intention of the sector-specific measures is to remove sector-specific administrative and technical barriers to trade and investment across the EU. The expected impact of the measures is that manufacturers will have equal access to each of the Member States, removing any advantages that the manufacturers in particular Member States might have had over their EU competitors. The removal of automotive sector barriers to trade and investment is then expected to increase competition and competitiveness within the EU automotive sector, lowering costs and prices to the consumer and making EU automotive manufacturers more competitive in the global market. These expected impacts are examined in detail in Chapters 4 to 9 of this report.

The EU is increasingly taking an economic approach to regulation, in which all the potential costs and benefits of new legislation are considered. This will ensure that decisions on new

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[1] In the USA, the approach to standardization is different. There, the standards bodies produce very detailed technical standards, but then the industry self-certifies itself to these standards. The sanction used is the civil liability court. This may allow US producers to develop new cars much more quickly but also results in producers being less innovative because of the high potential liability costs. Asia, Japan, Australia and Canada use the European type approach.

regulations take into account the full costs of complying with them as well as the benefits to different parties.

Horizontal measures

At the horizontal level, action was required at a European level to remove the distortions created by different regulations in each Member State. For example, if the administrative barriers between any two Member States made it easier to export from one to the other, then this would constitute unfair trade. Even if the barriers were equally stringent, if they operated in a different manner, then importers and exporters incur extra costs in learning and applying different systems between each Member State. Harmonizing such barriers at a European level therefore reduces the overall costs of doing business around Europe. Specific areas for European action are:

(a) inefficiencies in the road haulage system between and within the Member States as a result of administrative 'barriers';
(b) exchange rate fluctuations affecting the profitability and risks involved in trade and location decisions;
(c) different public procurement regimes limiting cross-border transactions in the utility markets for vehicles;
(d) different practices in enforcing intellectual property rights across the Community necessitating a series of applications to national patent and copyright offices.

The main horizontal measures are summarized below:

(a) The introduction of the Single Administrative Document (SAD) for transport between Member States in 1989 harmonized cross-border administrative formalities and provided some reductions in border delays. With the completion of the single market in 1993, the SAD was no longer needed for Member States as customs checks were removed. Within Member States, over a period of time, road haulage quotas and restrictions have been liberalized, facilitating the operation of transport companies within and between different countries. This has greatly aided the transferral of products across borders: it has reduced the cost of sourcing from suppliers in different Member States; eased the setting up of pan-European production; and facilitated the transfer of vehicles (i.e. the final product) across borders.
(b) There has been some reduction in the differences between VAT rates which apply to cars across the EU. The Community has developed a strategy for the approximation of VAT across the Community. This has not gone as far as was initially proposed, and the rates are now within an 'interim solution'. Further development in this area is envisaged (the definitive arrangement) but not yet agreed. A number of countries still impose extra fiscal charges on the purchase of vehicles. VAT and purchase taxes on vehicles in the EU are treated differently to almost all other products. The tax is applied in the country in which the vehicle has been registered, regardless of where it has been purchased (the 'destination principle'). Consumers of vehicles cannot therefore take advantage of lower tax countries for purchase. The taxes vary substantially and so these differences in taxes significantly affect the demand for vehicles in different Member States. Appendix D provides an overview of the different purchase and consumption taxes affecting the sector, which is summarized in Table 3.2.

Table 3.2. Taxes on acquisition

	VAT (%)	Sales tax		Registration charge
		Passenger cars	Commercial vehicles	
Belgium	20.5	based on cc + age	none	2,500 BFR
Denmark	25	105% up to 24,400 DKR 180% on the remainder taxable value = price inc. VAT	95%	1,000 DKR
Germany	15	none	none	54 DM
Spain	16	12%	none	8,650 PTA
France	18.6	none	none	88–160 FF & parafiscal charge
Greece	18	new car: 10–75%	new vehicle: 0–30%	8–16%
Ireland	21	<2.5 litres: 23.2% >2.5 litres: 29.5%	13.3% for LCV; otherwise IRL 40–100	
Italy	19	>21 HP (petrol) or 24 HP (diesel) 5–12 mio LIT (abolished 31.12.94)	transfer taxes	New: 230,000 LIT Used: 210,000 LIT
Luxembourg	15	none	none	1,128 LFR
Netherlands	17.5	petrol car: 45.2% – 3,394 HFL diesel car: 45.2% – 1,278 HFL	none	22-93.25 HFL
Portugal	16	based on cc, e.g. 1801:1,327,776 ESC	none	5,000 ESC
UK	17.5	none	none	
Austria	20	based on fuel consumption 7–14%	none	
Finland	22	100%	none	
Sweden	25	excise tax based on pollution	excise tax	

Source: ACEA, 1995.

(c) The public procurement directives have affected vehicle purchasing by the public sector. These require public bodies (including utilities) to follow a formal procedure which outlaws any national preferences. However, the public procurement directives only relate to 'above threshold' contracts, set at ECU 200,000 for regional and local government and ECU 125,000 for central government and other bodies (a limit specified in the GATT Procurement Agreement). We understand that public procurement represents around 10% of the commercial vehicle sector and so is an important factor affecting market access. As an example of opening up the market, the authorities in Rome have recently purchased German manufactured cars for their local police force.

(d) The setting up of the European Patent Office and the European Trade Mark Office have facilitated companies' ability to receive European patents and copyrights. This area of legislation is likely to be strengthened by the proposed directive on harmonizing Member States' laws on design protection.

3.1.2. Non-single-market related policies

In addition to the sector-specific and horizontal measures described above, there are a number of non-single-market measures which need to be considered because of their impact on the EU automotive sector:

(a) The 'block exemption' was not part of the single market programme, and so was not considered in detail in this study, but continues to be an important factor affecting the industry (and consumers of motor vehicles). The rationale for this block exemption of the automotive sector from Article 85 of the Treaty of Rome (on Restricted Agreements) was that motor vehicles are consumer durables which require expert maintenance and repair, not always in the same place. Manufacturers co-operate with selected dealers and

repairers in order to provide specialized servicing. On the grounds of capacity, it was argued that such a form of co-operation could not be extended to an unlimited number of dealers and repairers. The linking of servicing and distribution was therefore regarded as more efficient than a separation between a distribution organization for new vehicles, on the one hand, and a servicing organization which would also distribute spare parts, on the other.[2] This exemption means that manufacturers can develop exclusive and selective distribution agreements with their distributors.

However, a more liberalized block exemption has recently been agreed for the period up to 30 September 2002 in which:

(i) dealers are given greater commercial independence *vis-à-vis* manufacturers;

(ii) independent spare-part manufacturers and distributors are given easier access to the various markets, notably the outlets provided by the car manufacturers' networks;

(iii) the position of consumers is improved in accordance with the principles underlying the single market;

(iv) the dividing line between acceptable and unacceptable agreements has been made clearer.

(b) The area commonly perceived to support industry restructuring is the EU's trade policy ('Elements of Consensus'). We cover this briefly below, but again since it is not part of the single market programme, it will not form a significant part of our analysis. This is an arrangement on motor vehicles (passenger cars and light commercial vehicles below 5 tonnes) agreed by the Community and Japan in July 1991. It provides that Japan will monitor exports into the EU as a whole and to the five previously restricted markets (Spain, France, Italy, Portugal and UK) for a transitional period to end by 31 December 1999. The Elements of Consensus contain forecasts of exports in 1999, linked to assumptions about demand in that year. The forecasts for the intervening years are worked out through regular consultations between the European Commission and the Government of Japan on the basis of demand assumptions. The relevance of this measure to the sector is questionable, given that Japanese exports to the EU have been steadily decreasing and in 1994 were about 20% below the level forecast. This is a result of both the appreciation of the Yen and the growing reliance of Japanese manufacturers on their European manufacturing plants.

(c) The EU has put in place measures to limit the levels of pollutants from vehicles. These lay down different limit values for emissions from petrol and diesel vehicles. They cover carbon monoxide, unburned hydrocarbons, nitrogen oxides from petrol and diesel engines; and specifically for diesel engines, limit values for particulate pollutants. Different levels of standards for heavy vehicles have been set over time (Euro 1, 2 and 3). The European Commission is also currently examining a proposal for a common strategy on vehicle scrapping (End of Life Vehicles). Furthermore, the Commission recently adopted a communication on a strategy for reducing CO_2 emissions from passenger cars by improving fuel economy (COM(95) 689 final, 20.12.1995). In addition, the Commission, in co-operation with the European automotive and oil industries took part in the European Auto-Oil Programme. This was intended to provide a basis for new and coherent legislative proposals on vehicle emission and fuel quality standards, to come into force in 2000/2001, with a view to ensuring compliance with air

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[2] Based on Regulation (EEC) No 123/85 (12.12.1984).

quality standards. A cost-effectiveness analysis was a central part of this programme which was finalized in April 1996.

3.1.3. The global context

The approach to regulation in Europe differs from that in the USA and Japan. This is particularly so with respect to type approval. In both the USA and Japan there are different standards for components such as windscreens and headlights, and this imposes extra costs on global manufacturers. The US system relies heavily on civil lawsuits to encourage manufacturers to abide by the standards which have been set, rather than focusing on a government type approval system. These civil suits can result in multi-million dollar damages and some experts have argued that this imposes a constraint on innovation by US manufacturers. However, the lack of a formal government approval process means that vehicles can be introduced more quickly than in the EU.

Whilst the standards for emissions and side impact are converging on a global basis, the way in which they operate differs markedly. For example, the side impact test involves a collision at the same speed around the world, but at a different height, thus causing extra costs on manufacturers. Emission standards are converging, but the way in which they are measured vary widely according to the length of time the engine has been running.

Countries such as Sweden have in the past set very tight safety standards for vehicles manufactured in the country. This could have been seen as a burden on the industry. However, there is evidence that these higher standards have given them competitive advantage in other countries because they have allowed their home producers to enter niche markets where customers require high safety standards.

3.2. Remaining legal or administrative obstacles and/or shortcomings

We have discussed barriers which have been or are being addressed. The following list covers the main remaining obstacles for automotive manufacturers. The list is broken down into three categories of obstacles – those which create cost burdens for the industry and restrict market access, those which act as a barrier to the rationalization of the industry and therefore the global competitiveness of the industry and those issues where concerns have arisen but the case for EU action has not been proven.

(a) Constraints which create cost burdens and restrict market access:
   (i) Despite some attempts to approximate VAT, Member States still have very different tax structures for vehicles which impose large variant costs on producers. This has major RD&D and production implications and can place some specialist producers at a disadvantage because of the variants they specialize in and their treatment by some Member States' tax regimes.
   (ii) Exchange rate instability imposes costs of hedging on the EU automotive producers both in terms of trade and location decisions. These difficulties are more pronounced for the more nationally focused manufacturers, who are less able to lay off exchange rate risks through location and sourcing decisions for components.
   (iii) Different standards in each global market increase design costs and constrain production economies of scale. Moreover, the differences in trajectory of these

standards mean that in the long run, more serious problems concerning the global competitiveness of the EU automotive industry compared to the US, Japanese and Korean industries might arise.

(iv) Different internal standards within the EU automotive industry remain. This means that component suppliers have to deal with different quality standards from different manufacturers, reducing their potential for economies of scale.

(v) Each Member State still has differences in the administration of national registration procedures. The requirements of the registration authorities mean that different data and presentation of these data is required, imposing an additional administrative burden on producers.

(b) Constraints acting as a barrier to rationalization in the industry:

(i) The definition of the market in monopoly investigations and the split between Member State and Community competition authorities. There have been instances of mergers in the automotive sector being blocked by the national competition authorities on the basis of a narrow relevant market definition. The single market should mean that a wider relevant geographic and product market definition should be used, increasing the likelihood of rationalization on a European-wide basis.

(ii) Too great a prevalence of small, nationally orientated players in the EU compared with the much larger competitors in North America and Japan. It has been suggested that this problem has been maintained through state aids, delaying some necessary rationalization of the European industry.

(c) Issues in which a case for EU action has not yet been proven:

(i) Member States have different ways of dealing with end-of-life vehicles, affecting the demand profiles of consumers in each of these countries both in terms of when they buy and what they buy.

(ii) Differences in the implementation of roadworthiness tests remain both in terms of frequency and scope.

(iii) The need to manufacture left-hand and right-hand drive vehicles to access the whole of the EU restricts the entry of specialist producers as well as the entry of the full range of vehicles by volume manufacturers.

(d) Obstacles as a result of having different measures in non-European countries, i.e. the benefits to be received by the single market may be mitigated by the global market-place.

We discuss these barriers throughout the report and, in our conclusions, summarize the future actions we believe are required for the full implementation of the single market.

4. Methodological approach

The central aim of this report is to find out the effect of the single market programme on the automotive sector. The key issue in tackling this question is the way in which the research should disentangle the effects of the single market programme from the other factors affecting the industry. This is neither simple nor straightforward, and in this section we explain in some detail our methodology for examining the impact of the single market programme on the automotive sector.

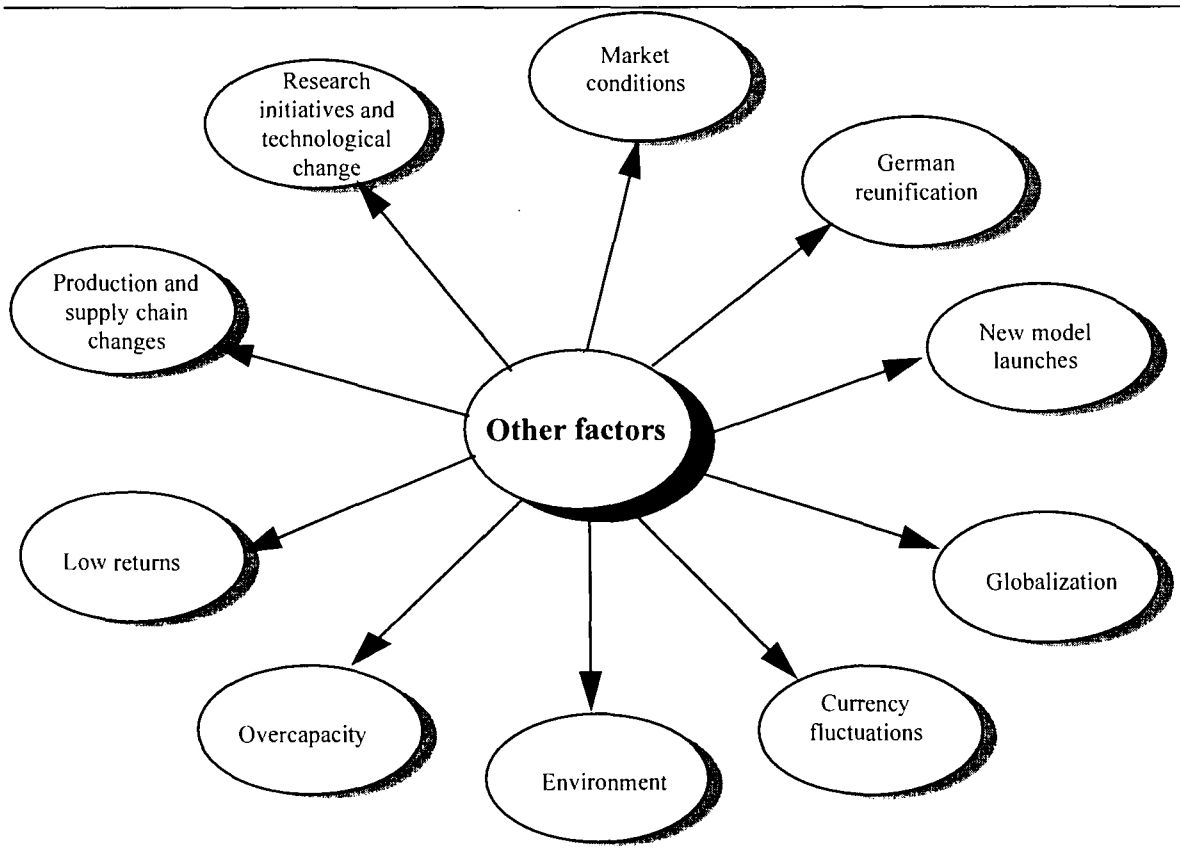
We have structured this chapter in the following way:

4.1. the other factors affecting this sector;
4.2. our approach to disentangling the single market programme effects, including our hierarchy of hypotheses;
4.3. the methods used to analyse and test the hypotheses.

4.1. Other factors affecting the motor vehicles sector

This section categorizes the other factors affecting the industry as follows:

Figure 4.1. The other factors



4.1.1. Market conditions

At the same time as the implementation of many of the measures included in the single market programme, much of Europe was experiencing recession, particularly during 1991/92. To add to the difficulty of factoring this into our calculations, some countries have been hit harder than others, and at different times. Some countries' reaction to these adverse market conditions will also have an impact on the sector. For example, it is claimed that the French government's scrappage incentives were partly influenced by market conditions.

Market conditions in other parts of the world have also been an important factor. For example, North America is a vital market for European-built high value cars. The US safety and emissions standards have been a bigger driver than the European standards for some marques (for example, in their introduction of high level brake lights). However, those European firms present suffered a catastrophic fall in sales between 1986 and 1993. There has been some recovery since then, but Japanese firms have taken a strong hold over the luxury car segment (particularly with the Lexus LS400).

4.1.2. German reunification

The reunification of Germany has been an important factor for the European industry. This is likely to have increased sales within Germany at a time when most of the rest of Europe was experiencing deep recession. As demand for second-hand cars increased from the eastern regions of Germany, sales of new cars (which were predominantly produced in Germany) in western regions increased. This factor is therefore likely to have affected the propensity for German producers to sell to their national domestic market, rather than to other Member State markets. In addition, German reunification has provided new production locations for VW, Opel and many component firms. Any analysis of trade flows must therefore take this into account.

4.1.3. New model launches

Automotive assemblers' success is to a large degree dependent on the success of each new model launch. Each new model involves significant sunk costs in RD&D and production facilities. We estimate that each new model requires an investment of typically ECU 200–300 million. If sales do not satisfy this up-front cost, then the company profitability is affected over the long-term. Equally, successful new model launches, such as the Fiat Punto, will have a significant effect on trade flows. Even if we find that intra-Community trade has increased, this may to a large extent be a result of new pan-European model launches.

4.1.4. Globalization

Globalization can be considered in three interlinked areas: the interpenetration of markets, the spatial extension of production, and the formation of pan-national alliances. Over the past 20 years, there has been a great deal of exports into markets, particularly from Japan to North America to Europe. This has recently decreased as a result of the appreciation of the Yen and the increasing FDI into Europe. In other words, new investment locations may increase or decrease trade flows.

New Japanese capacity in Europe is expected to be 2 million units by the year 2000. However, the most globally organized companies are GM and Ford. There is growth in European

capacity in the 'EU periphery' (for example, in Portugal, southern Italy, former East Germany). There is also growth just outside Europe, for example Fiat's investment in Poland.

Production alliances are a feature of the industry, as are various marketing or 'badge engineering' agreements, for example, the Ford Maverick is manufactured at Nissan's Spanish plant. Alliances are a means of virtual integration – achieving the benefits of scale without the costs of integration. Important alliances in Europe include Volvo and Mitsubishi (Nedcar), VW and Ford in Portugal. These can affect trade flows in all sorts of ways.

4.1.5. Currency fluctuations

Currencies fluctuate over time, and this affects the price of vehicles (or their profitability) if they are traded across borders. If prices can be lowered as a result of currency changes, then exports may increase from countries which have devalued to countries which have not. Increases in trade between these countries may simply be caused by these currency movements, rather than by the single market programme. A clear example of this has been the export of cars out of Italy. Consumers in France, Germany and Austria have been crossing the border and buying cars more cheaply in Italy. This has had knock-on effects for the dealerships in those countries. Whilst the ERM was formed to limit these fluctuations, during the period in question there were severe perturbations to the system, the fluctuation bands were widened and a number of European countries left the mechanism. We must therefore factor this into our assessment. In looking forward to future actions, policy-makers will need to assess whether these severe perturbations were a 'one off', or may recur for countries outside a single currency.

The rise of the Yen has pushed up market prices for Japanese-made cars, and is an important element in both further attempts at efficiency improvements within Japan and the globalization of production. Equally, the strength of the German Mark is a factor in the long-term movement of productive capital out of Germany. Our analysis seeks to account for the impact caused by currency fluctuations.

4.1.6. Over-capacity

In Europe, there appears to be an overall surplus of capacity of around 20% relative to average demand – though in historical and global terms, this is common. However, there is an emerging over-capacity in small sports cars, 4-wheel drive vehicles, standard saloons and people carriers (MPVs). Longer term over-capacity may reach 50% by the year 2000.

Capacity is a moving target, in that available capacity may increase without new plant investment as a result of improvements in productivity within existing plant. Capacity is also relative to demand. The extent to which capacity of specific models or types of vehicle can be changed is also of importance. In the USA, for example, Ford and GM have been converting plants which made large saloons into plant to make pick-up trucks. In addition, manufacturers have also lowered their break-even points in response to the evolution of the cyclical car market.

4.1.7. Low returns

Long-term profit trends in the industry show low returns, getting even lower, with highly cyclical swings. In Europe, in the last 30 years, only BMW has been consistently profitable.

Others have been consistently unprofitable, or of marginal profitability. This is a major long-term structural problem, as profits are needed to develop new models.

Some companies are better placed. Volvo has assets following its strategy of selling non-core businesses and BMW has substantial cash reserves. Individual or family ownership is still important in the cases of Fiat (Agnelli), BMW (Quant), PSA (Peugeot) and Porsche (Piech). The French state still controls Renault, although this could be privatized in due course.

4.1.8. Production and supply chain changes

Japanese transplants have achieved remarkable production performances, for example in the hours required to build a vehicle; in the time required to reach full production after introducing a new model; and in the output of vehicles per employee. European industry is catching up, partly through radical changes in work organization, teamworking and the elimination of demarcations. Elsewhere in Europe, shift patterns, holidays and working time all vary widely. In many instances, working time is less than in Japan or the USA. Many of the European plants (including Ford and GM) are long-established, with poor layout and access. Newer plants (e.g. Fiat at Melfi) are much more competitive.

Few European assemblers have global purchasing practices (as, for example, with GM and Ford), or even well developed purchasing capability across Europe (for example, Sogedac/PSA still buys largely in France and Spain). However, Volvo's strategy of seeking world class suppliers actively to support its products has resulted in an increase in spending in Japan. Assemblers are, however, trying to build these links at a global level. Assemblers are increasingly using Electronic Data Interchange (EDI), and Just in Time (JIT) delivery techniques to squeeze costs further. Newer plants such as Toyota at Burneston in the UK and Fiat at Melfi in Italy have a number of their suppliers alongside the factory to facilitate the process.

4.1.9. Research initiatives and technological change

Research initiatives can be national (e.g. the UK-based IMI programme) or pan-European (e.g. Prometheus, Drive, Eureka). Of particular importance is EUCAR, an umbrella grouping of vehicle assemblers to promote co-operative pre-competitive research projects under the 4th Framework Programme. These initiatives provide a mechanism to bring in suppliers and assemblers, reduce risk, share cost, and provide a clear direction for change. Major topics include: new vehicle design and use concepts, innovative drivetrain technologies (e.g. fuel cells, gas turbine hybrids, advanced batteries), innovative body materials, advanced telematics and vehicle navigational systems and advanced urban traffic management systems.

Technological advances in other areas are important too – especially in information and communication technologies which have a direct impact on the vehicle design process (networked CAD/CAM), purchasing (EDI) and vehicle sales and distribution (EDI).

4.1.10. Environmental impact

An additional factor driving change in the automotive industry is the growing body of scientific evidence on the environmental damage caused by the automotive sector, and the economic consequences of that damage. In this regard, the Intergovernmental Panel on Climate Change has given further urgency to the search for a reduction in CO_2 emissions from

vehicle production and use, ascribing for the first time a human agency to global climate change. The European Union committed itself at the 1992 Rio Summit to stabilize CO_2 emissions by the year 2000 to 1990 levels and thereafter to reduce CO_2 emissions. In early 1996, the European Commission released a discussion document on its carbon tax proposals, which entail setting fuel economy targets with tax penalties for vehicles which exceed the appropriate target. There can be no doubt that some form of carbon tax will have profound consequences for the European automotive industry; at this stage the impact will be felt most acutely in the RD&D activities.

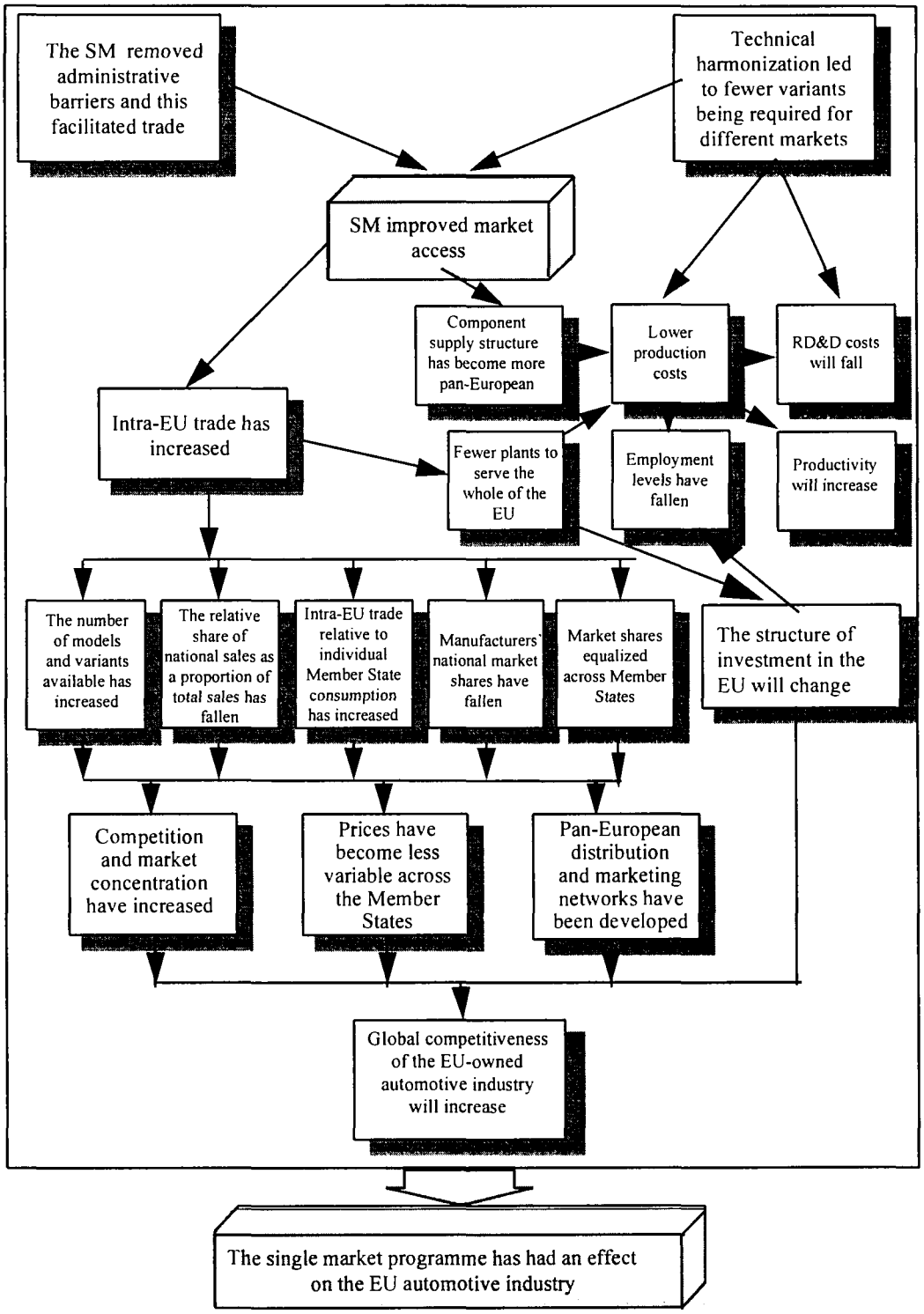
4.2. Our approach

4.2.1. The hierarchy of hypotheses

We have constructed a hierarchy of hypotheses which, if validated, will help us to disentangle and understand the effects of the single market programme. The hierarchy of hypotheses is illustrated in Figure 4.2. Proving one hypothesis will not in itself prove that the single market has had any effect. However, if evidence is collected which tends to support a number of related hypotheses, the claim that the single market has had an effect on the industry becomes more robust. In addition, when examining each hypothesis we can consider both the role of the single market programme and of other factors (such as those discussed in Section 4.1) in bringing about any change.

The hierarchy of hypotheses often goes down to a level of detail where there is only one data set that can be used to test the hypothesis. This is a strength of our analysis, since it often means that we can be more sure of whether the single market programme has had an effect. However, there are some cases where more than one data set, and hence more than one analysis, can be used. Where this is the case, more than one test of the hypothesis is carried out to gain a wider picture of the single market programme impact. In any case, a single hypothesis, if correct, leads to another which can be separately analysed. The reason for using the hierarchy of hypotheses is that more measures allow us to draw firmer conclusions about the degree of the single market programme impact (compared with other effects). If we were to use just one analysis for, say, the hypothesis that the single market has improved market access, it is quite likely that we might come to the wrong (or at least an extremely constrained) conclusion. A variety of hypotheses and measures mean that we can state with more confidence what we have found and what part the single market programme played in the observed results.

Figure 4.2. The hierarchy of hypotheses



There are two key actions of single market programme implementation which are likely to have had an effect on the EU automotive industry. These form our central hypotheses:

(a) the single market programme removed administrative barriers and this has facilitated trade;
(b) technical harmonization led to fewer variants being required for different markets.

Under these hypotheses, reductions in administrative barriers would be expected to yield reductions in the costs of intra-EU trade because delays at borders would decrease and haulier costs reduce. Technical harmonization is expected to increase market access because producers had to manufacture fewer variants and the regulatory approval process for new vehicles was streamlined. The need to produce fewer variants should lead to reductions in the costs of production because down-time would be reduced, and in RD&D because fewer different variants would have to be designed.

Because market access was eased, it is expected that producers could sell more of their products in other Member States with consequences for product availability and market shares. This increases competition in each country and results in higher concentration. The variance of prices is also expected to fall across the EU Member States as the market becomes more competitive. Companies could also set up European distribution and marketing networks to take advantage of these opportunities.

Because producers could trade more easily between countries, fewer manufacturing plants would be required. The structure of investment is likely to change as firms change their location decisions and their capacity utilization by extending existing plant and investing in new plant.

Similar causal effects are also expected to have had an impact on the component supply industry. In turn, this is expected to have had a knock-on effect on the automotive assemblers, with increased competition reducing purchasing and thus overall production costs.

As a result of all of these hypotheses, it is expected that the EU-owned manufacturers will become more competitive in the global market.

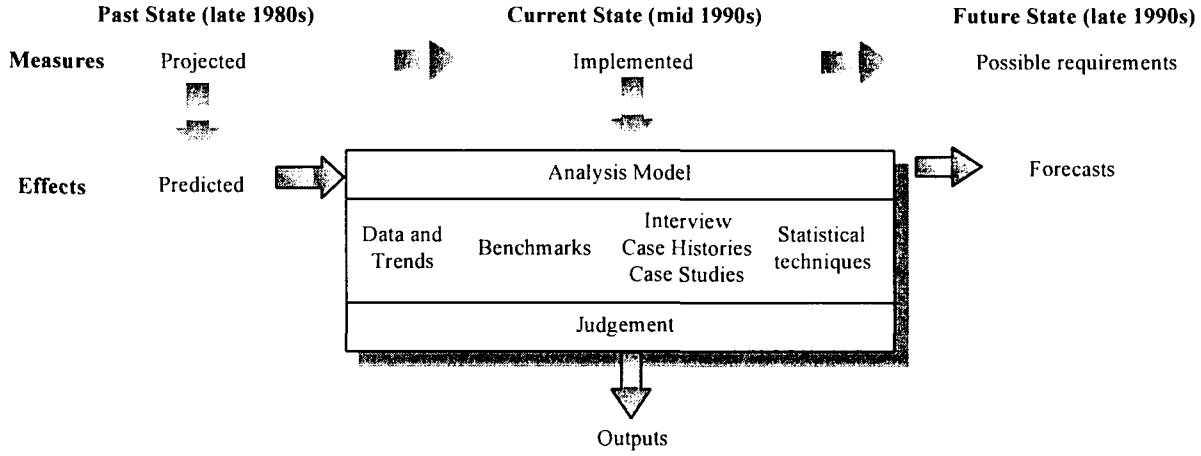
Figure 4.2 shows the key importance of market access improvements to the assessment of the impact of the single market programme on the EU automotive industry. As discussed in Section 4.1, changes in market access may also be due to factors other than the single market programme. If these other factors have a higher weighting than the single market, then the downstream effects of levels of competition, prices, and fragmenting market shares must also be ascribed to these other factors.

4.3. Methods used for analysing and testing the hypotheses

4.3.1. The impact assessment model

In assessing individual factors and thus validating particular hypotheses, we make use of an 'impact assessment model' (reproduced in Figure 4.3).

Figure 4.3. Impact assessment model



This model uses a number of different measurement techniques for assessing the impact of the single market programme ('triangulation'). A variety of complementary measures are used to assess the single market programme impact and we have tried, as far as possible, to consider and remove some of the other factors which could affect these results. For example, within our analysis of market access, we have assessed the degree to which each company's dependence on domestic sales is correlated to the relative market conditions between the domestic and European market.

Quantitative analysis

We have used a number of quantitative techniques to assess the impact of the single market programme:

(a) the examination of trends;
(b) correlation analysis of a number of variables;
(c) the Elzinga–Hogarty technique;
(d) concentration ratios and the Herschman–Herfindahl index;
(e) econometric analysis of the determinants of automotive industry employment.

Despite the fact that econometric analysis was attempted, there is an underlying data problem in trying to examine the impact of the single market programme using this technique. In fact, the decision to use a number of techniques has been made because of problems with the data available. Despite the fact that the automotive sector is relatively 'data rich' compared to other sectors, the collection and presentation of these data by trade associations and government bodies means that analysis is more difficult than it initially seems.

Much of the analysis we would like to carry out is on a national firm or Member State basis. However, the very fact that the industry is data rich means that aggregation of these data takes time. At the time of publication, the only official (trade association and government) aggregate, pan-European data available cover the period up to 1993. Any data following 1993 on a pan-European basis are strictly unofficial, unverified data. Naturally, carrying out econometric analysis using data up to 1993 to assess the impact of the single market programme which was implemented in 1993 is a largely fruitless exercise.

An example of problems with data consistency and the length of data available is given by the EU price data. In any econometric analysis of the impact of the single market programme, the price of vehicles is obviously an important factor. Unfortunately, the EU car price statistics started in May 1993 and are published only twice a year, giving us only six data points. This is far too low to allow statistically significant results. These data could be supplemented by alternative sources going back further, but the problem with consistent measurement and collection techniques arises once more. Consistency problems are aggravated as over the period May 1993 to November 1995, the types of car available have changed as new models have been launched and old models ceased to be produced.

In addition to the data problems confronting the econometrician, there is a methodological problem with using econometric analysis to assess the impact of the single market programme, even if the data were available. Econometric analysis is most robust where there is a limited set of variables which are strongly related to the variable we are trying to explain. However, it is clear that there is a multitude of factors strongly related to the EU automotive sector. This leaves the econometric analysis attempting to explain the impact of the single market programme through the error term, referred to by economists as 'white noise'. Any conclusions drawn from an analysis of the error term would be extremely tentative and would not stand up to scrutiny. Therefore, we are faced with an industry in which there are large amounts of data, but data which are not suitable for econometric analysis.

For the reasons presented above, we have developed the hierarchy of hypotheses approach to the assessment of the single market programme impact. This approach allows us to exploit all the information available from the data rich areas of the automotive sector and allows the assessment of the other factors on a case-by-case basis. Where possible, quantitative techniques have been employed in testing the hypotheses.

Qualitative analysis

The impact assessment model also makes use of extensive qualitative data. We undertook a series of case studies and a substantial interview programme with major manufacturers, component suppliers, trade, research and certification bodies as well as academic researchers. These provide explanations, insights and judgements about our hypotheses and are included in our analysis. The case studies provide more judgmental views on the effects of the single market programme.

The case studies further show the degree to which company strategy was influenced by the single market programme before and after implementation. They also show the extent to which companies have changed their business processes and structures and predicted the effect of the single market programme before it was implemented (in economic terms rational expectations). This economic theory predicts that people will act on expected policy changes (and the policy's likely implications) well before the policy is implemented. This smoothes out the impact of changes expected to occur in the future. Automotive manufacturers were familiar with the single market programme since the Cockfield White Paper (1985)[3] and the Single European Act (1987). Technical harmonization in the automotive industry predates the single market programme by a decade. In addition, measures were implemented gradually over

[3] European Commission, *Completing the internal market*, COM(85) 310 final, Luxembourg: Office for Official Publications of the EC, 1985.

the period leading up to 1993. Therefore, manufacturers will have anticipated and acted on many of the expected changes well before they were implemented. It is likely, therefore, that any changes as a result of the single market programme will have occurred in a smooth fashion from well before 1993.

The model also uses the concept of 'the counterfactual'. If we find that the industry has suffered declines in certain areas, then we cannot assume that the single market programme has had a zero or negative effect. It could be the case that the single market programme improved the position of EU automotive manufacturers and without its support, the decline would have been greater.

4.3.2. Types of data

As noted in Section 4.3.1, there are a number of problems caused by the data available from the automotive sector. Bearing this in mind, we have considered four possible types of data for our analysis. These are described in Table 4.1.

Table 4.1. Four approaches to collecting data

Approaches	Description	Positive aspects	Negative aspects
A. Individual company	Take a real world example, e.g. PSA	Actual data available, consistency and fit of data; extrapolation	Representativeness; lack of comprehensive data; cost sensitivity; balance and fairness; lack of fit with brief
B. Idealized best practice	Take best practice performance in each functional area; factor-in single market effects	Many basic benchmarks exist; fit with EU benchmarking study; de-politicized	Micro-level; non-cost data; ignores social and real world context; cannot extrapolate
C. Aggregate industry	Use statistics on the whole sector through which assumptions on the effect of single market will be processed	Uses Eurostat and other aggregate sources; closest fit to brief	Methodology; explaining an error term; historical data; data definition and changes; market cycles; industry initiatives; lack of availability
D. Average firm	Calculate an average firm based on available data, use this to produce basic model through which single market impacts should be run	Can extrapolate back up to aggregate; uses mixed data sources; de-politicized; company confidentiality	Representativeness; meaningful averages

No single type of data is ideal, and so we have used all four types across our analysis, depending on their availability and explanatory power. For example, we use many examples drawn from our knowledge of existing companies in terms of their prices, models and market shares. Aggregate industry data are used in the areas of trade, market size and industry concentration. Average firm data are provided in the area of dealership networks and productivity. Idealized best practice data are provided for productivity.

National measures

In addition to the aggregation problems and restricted length of data available referred to in Section 4.3.1, the way that data are collected and reported in the automotive sector creates a dilemma in the presentation and analysis of Member State effects of the single market programme. Industry data sources often refer exclusively to production and trade by the five major producing states in the EU – Germany, France, Italy, UK and Sweden. Output is

recorded from these states, even if the production was carried out in another Member State, such as Spain or Belgium. For example, VAG's output is recorded under Germany, even though a large amount of production is carried out in Spain at the Seat plants. The very barriers the single market (and before this the Common Market) sought to remove created the situation where many of the EU manufacturers are located throughout the EU as an easy means of accessing these markets. Despite the growing internationalization of the automotive industry, it is still the case that many firms which were originally based in EU Member States rely on their original market for a large proportion of their sales. Throughout this report, therefore, because of the way that data are recorded we refer to 'national' output of Germany, France, Italy, Sweden and the UK, even though the concept is increasingly irrelevant to the EU automotive sector. Where possible, we refer to other EU automotive producing countries, such as Belgium and Spain, where production facilities are owned by, for example, Ford and VAG respectively.

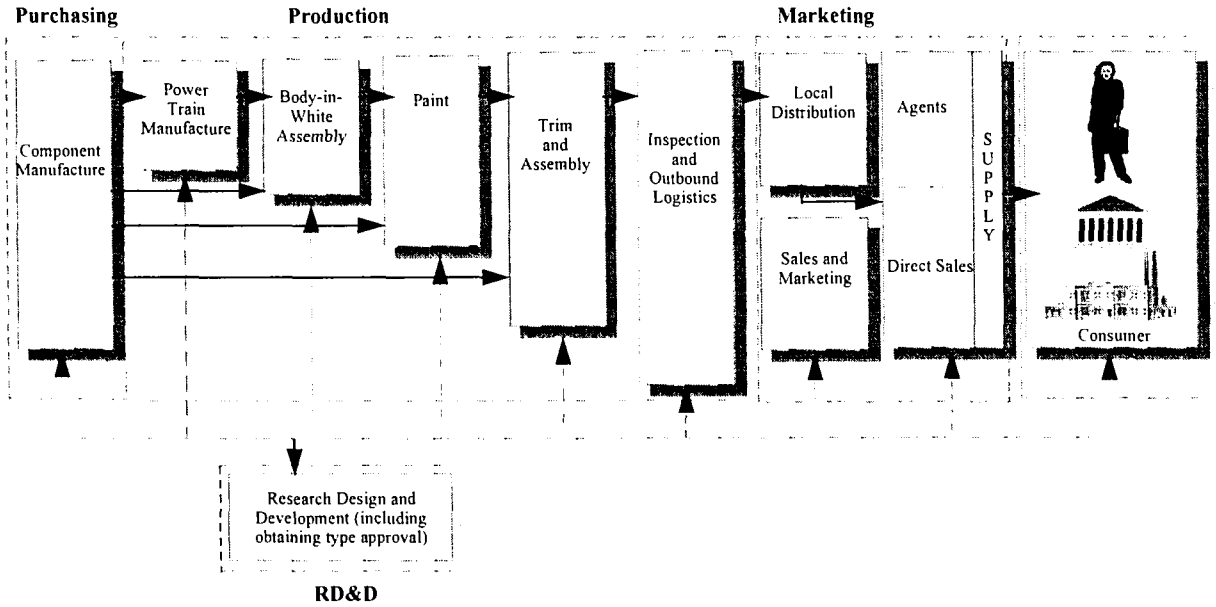
4.3.3. The industry process model

It is important to distinguish between the effects of the single market programme on each business process. In order to do this the analysis is broken down into four main groupings:

(a) marketing,
(b) production,
(c) purchasing,
(d) research, design and development (RD&D).

Figure 4.4 illustrates the linkages between these four groupings.

Figure 4.4. Industry process model



Our hypotheses (described in Section 4.2) are linked to each of these in the following way:

Table 4.2. Hypotheses and business processes

Hypothesis	Business process affected
Improved market access	Marketing
Intra-EU trade at an aggregate level will increase	Marketing
The number of models and variants available will increase	Marketing
The relative share of national sales as a proportion of total sales will fall	Marketing
Intra-EU trade relative to individual Member State consumption will increase	Marketing
Manufacturer national market shares will fall	Marketing
Manufacturer market shares will equalize across Member States	Marketing
Competition and market concentration have increased	Marketing
Prices will become less variable across the Member States	Marketing
Pan-European distribution and marketing networks will be developed	Marketing
Production costs will be lower	Production
Productivity will increase	Production
Employment levels will fall	Production
The structure of investment in the EU will change	Production
Component supply structure has become more pan-European	Purchasing
RD&D costs will fall	RD&D
Global competitiveness of the EU-owned automotive industry will increase	All

4.3.4. The structure of the analysis

The chapters which follow analyse the effects of the single market programme for each of these hypotheses. We have structured our examination of each hypothesis in the following way:

(a) **Expected impact** – This describes what effect we expect the single market programme to have on the specific area of the automotive industry to be examined.
(b) **Other factors** – This describes what other factors are likely to have an effect on each of our specific analyses and is key to disentangling the single market effect.
(c) **Quantitative analysis** – This sets out the quantitative analysis that has been carried out in order to determine the impact of the single market programme and the impact of the other factors.
(d) **Actual impact** – This takes our findings from the quantitative analysis and from our discussions and interviews with trade associations and companies to provide our conclusions on their implications on the single market impact.

We also summarize the findings for each hypothesis in diagrams. Throughout the analysis we explain the link between the single market programme, other factors and the hypothesis under examination.

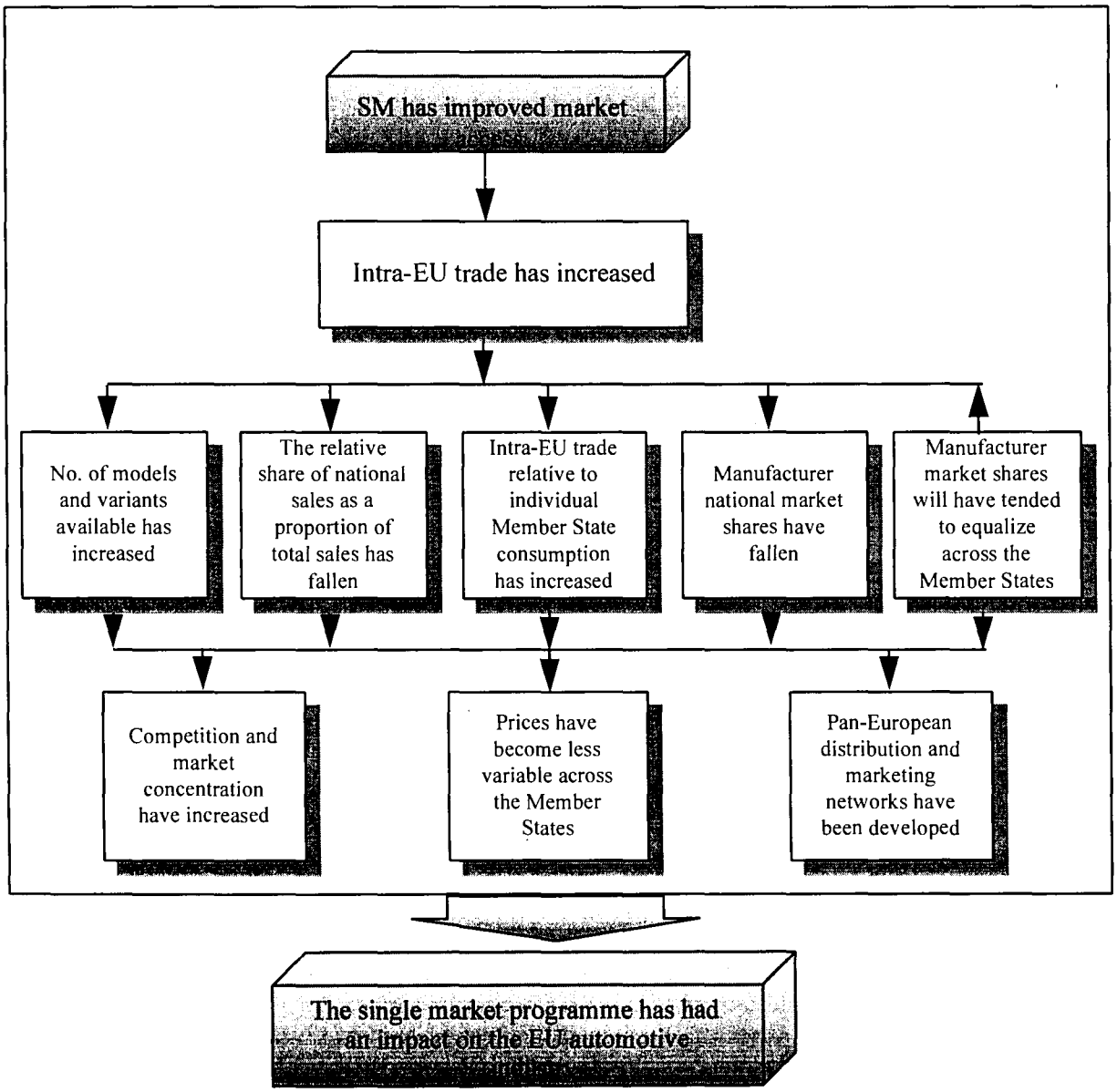
Because of the importance of the changes in market access, we have presented our findings on marketing in a stand-alone chapter (Chapter 5) in which we discuss the effects of market access in terms of changes in market shares, concentration, pricing and marketing and

distribution networks. Chapter 6 covers the other functional areas: production, purchasing, and RD&D. Chapter 7 then considers our final hypothesis on the impact of the single market programme in considering the global competitiveness of the EU-owned automotive industry.

5. Marketing

Chapter 4 set out the methodological approach undertaken to carry out this study. This section examines the hypotheses directly related to marketing. Figure 5.1 below extracts the hypotheses related to marketing from the full set presented in Section 4.2 and Figure 4.2.

Figure 5.1 Hypotheses relating to marketing



Section 5.1 examines market access, the first three tiers of Figure 5.1, Section 5.2 examines competition and market concentration in the EU Member States, Section 5.3 examines final prices across the Member States and Section 5.4 analyses the behaviour of automotive manufacturers through pan-European networks.

5.1. Market access

5.1.1. Introduction

This section is an in-depth analysis of the effects of the single market programme on market access. Given that one of the main objectives of the single market programme was to improve trading conditions across Europe, the measurement of changes in market access is extremely important. However, since many of the explicit tariff barriers were removed under the Common Market by 1968 (or upon accession of a new Member State), substantial changes in market access will have occurred well before the single market programme was implemented.

In order to investigate fully the impact of the single market programme on market access, we have used a wide range of measures. Improvements in market access are likely to be wide ranging, affecting different areas of the automotive industry in different ways. Consumers are likely to be affected differently to manufacturers, and Member States are likely to respond differently to single market measures. In addition, the impact of the single market programme is likely to affect the overall competitive environment of the EU automotive industry. Therefore, if we were to use just one analysis for the hypothesis that the single market programme has improved market access, we would clearly miss a lot of the possible impact. For this reason, we have constructed a number of separate hypotheses as shown in Figure 5.1, none of which will determine the full impact of the single market programme on its own, but as a group will enable more robust and wide-ranging conclusions.

Many of these analyses are linked but are subtly different from each other, enabling us to construct a complete picture in a complicated area. We suggest that readers who prefer a quick analysis of the situation first may wish to glance through our intermediate conclusion on market access, which we present in Section 4.1.10, before studying each of the individual hypotheses.

5.1.2. Types of data

The central hypothesis relating to market access is that intra-EU trade has increased. As we discussed in Section 4.3.2, this can be measured at a number of different levels – in aggregate, on a national and on a manufacturer basis. The aggregate measures can be useful, but more detailed analysis and results can be found through the examination of country and manufacturer behaviour. The third tier of Figure 5.1 shows the hypotheses which, along with the aggregate measure, have been tested to gain a full picture of the impact of the single market programme through improved market access. Each of these hypotheses has been analysed in turn, starting with analyses of the aggregate level and working down to analyses of manufacturers. For each hypothesis, the expected impact of the single market programme is assessed. The data gathered is then analysed and the actual impact observed regarding its consistency with the expected impact of the single market programme.

Before we examine each of the specific hypotheses, we have carried out a number of analyses of the other factors which are likely to affect our results. We have limited this to the key

factors which can be quantified – the impact of changes in relative market conditions on trade and the impact of currency fluctuations on trade. These factors are likely to affect a number of our hypotheses and so it is important to see what role they are likely to play in our analysis. We have done this through correlation analysis. It must be noted, however, that even these analyses will not provide definitive conclusions since different companies are likely to react to external conditions in different ways.

5.1.3. Pre-analyses – other factors

Relative market conditions

Much of our analysis which follows in this report examines the flow of trade and the relative share of manufacturers' output sold in other Member States. Relative economic conditions in each Member State may be a factor affecting our results. Correlating an automotive manufacturer's relative share of sales in the national market[4] with the economic conditions in each Member State will indicate the extent to which our results in the following sections are being influenced by market conditions. It is expected that there will be a correlation since market conditions are a key factor in determining demand in the national and non-national markets of a manufacturer. To assess the impact of the recession on the automotive sector in each of the Member States, we need a variable which will act as a proxy for recessionary or inflationary effects on the economy. The most suitable measure for this is the number of registrations in that Member State, since this will be a direct reflection of a number of different factors such as inflation, interest rates and the overall health of the economy. The decision of consumers to buy a new vehicle will be directly based on these factors.

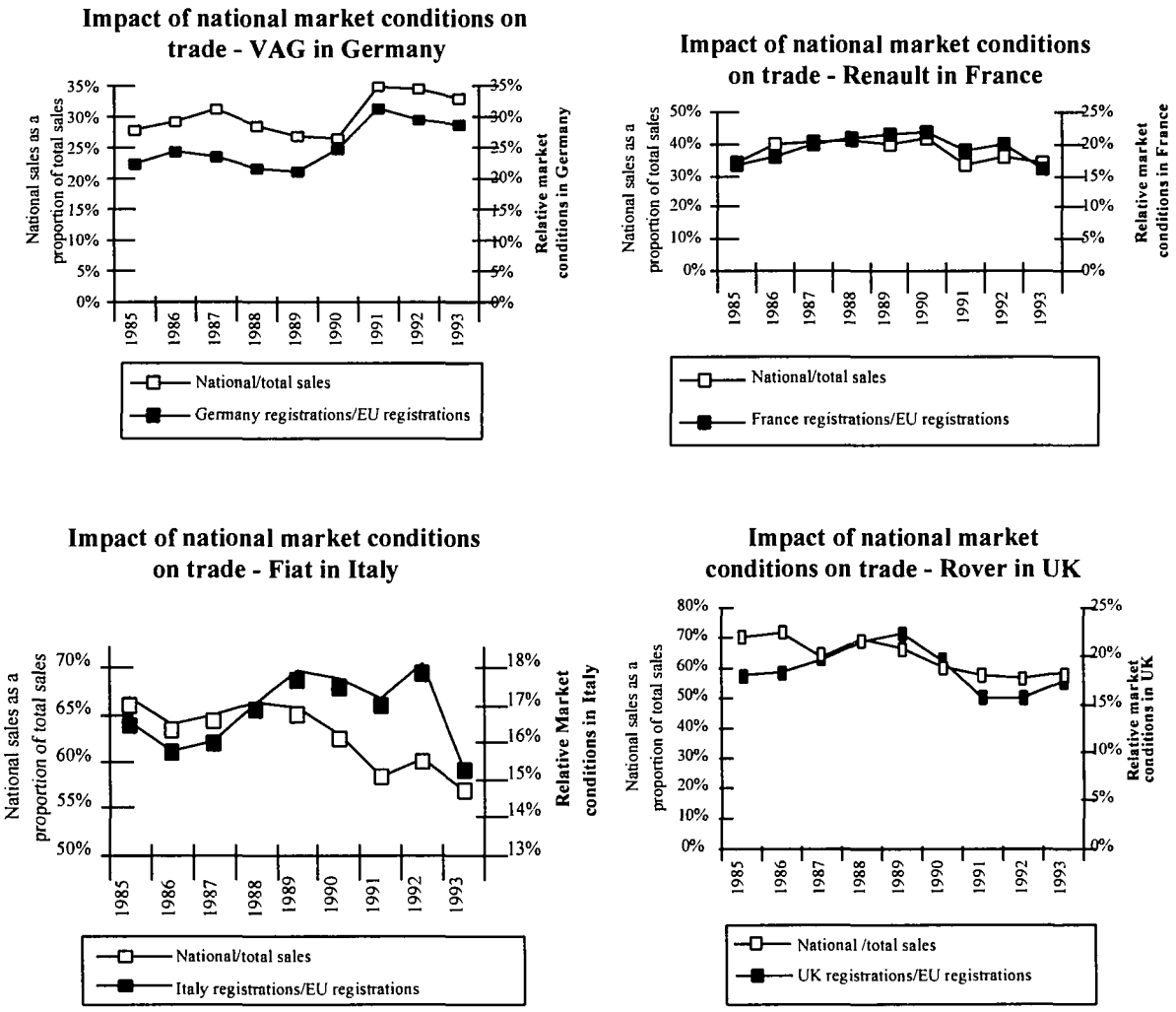
It will not be good enough to focus simply on the number of registrations in a Member State in isolation as our measure of market conditions, since this would ignore the relative attractiveness of the other Member States to manufacturers seeking to maintain and increase sales. Recessionary or inflationary conditions of different strengths and at different times in each Member State will affect trade between different Member States and will affect a manufacturer's share of sales in the national market relative to the rest of the EU. Therefore, our measure of relative economic conditions is the share of EU registrations accounted for by the single Member State. This measure reflects the relative attractiveness of the national market relative to the rest of the EU. For example, if the share of total EU registrations in Italy is falling, the recession is hitting harder in Italy than in the rest of the EU and vice versa. This relative recessionary effect is likely to have an effect on the national producer's share of sales in this market, since it has become less attractive relative to the rest of the EU. The analysis which follows examines the relationship between the relative attractiveness of the national market against the share of total EU registrations held in this market by the national producer. The stronger the relationship between these two effects, the more likely it is that trade between Member States has been affected by relative market conditions.

Figure 5.2 shows the results of this analysis carried out for a number of producers across the EU. The left-hand axis shows the manufacturer's share of sales in the national market, the right-hand axis shows the relative impact of the recession in that market. Therefore, if the two lines closely follow each other, it is likely that relative market conditions in this market are

[4] We use our definition of the national market as explained in Section 4.3.2.

affecting the manufacturer's sales in the national market relative to sales in the rest of the EU, and therefore affects trade. The data used for this analysis were Ward's series of 1985–93. Unfortunately, this series is yet to be updated. However, this should not affect our analysis, since there is no economic reason for the relationship between trade and relative market conditions to change immediately after the single market programme was implemented.

Figure 5.2. National sales as a proportion of total sales and relative market conditions, passenger cars, 1985–93



Sources: Ward's, E&Y.

Table 5.1 shows the correlation coefficients calculated from the data shown in Figure 5.2. A correlation coefficient gives an idea of the relationship between two variables, in this case relative market conditions and the dependence of manufacturers on their national market. The correlation coefficient ranges between -1 (perfect negative correlation) through 0 (no correlation), to +1 (perfect positive correlation). The only problem with using correlation coefficients is that there is no benchmark value for what is a 'strong' correlation and what is not. Judgement depending on the variables involved therefore has to play a part in the

assessment of the correlation coefficients. It is reasonable to assume under this analysis that anything above 0.5 is a fairly strong correlation.

Table 5.1. Correlation coefficients of dependence on national market and relative market conditions, passenger cars, 1985–93

Germany	France	Italy	UK
0.88	0.72	0.17	0.57

Source: E&Y.

Table 5.1 and Figure 5.2 show that:

(a) There appears to be a high correlation between relative market conditions and the domestic share of sales for all of the countries except Italy. We show later in this section that currency fluctuations appear to play a more important role in determining Italian market share.

(b) In general, relative market conditions play an important role in determining the extent of sales sold outside the national market.

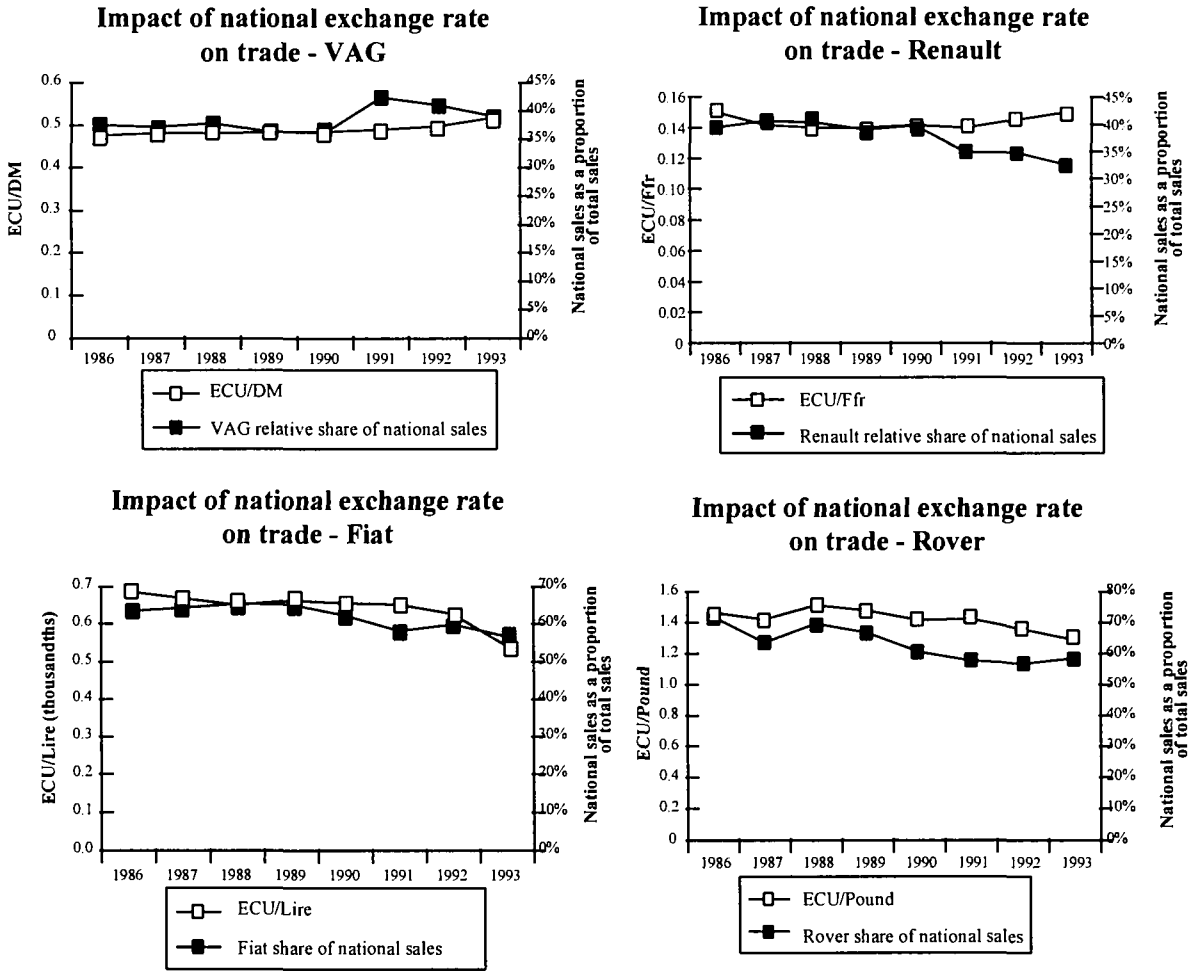
As the relative impact of recession is felt less in, say, Germany, less of VAG's product is sold abroad and vice versa. This is reflected by the line for German registrations over total EU registrations rising along with the line for national over total sales. As a volume producer, VAG concentrates on sales in its national market when demand is strong in that market. When demand is low, VAG looks to foreign markets to maintain sales.

Currency fluctuations

The proportion of a manufacturer's sales on the national market is also likely to be affected by the exchange rate. As a currency appreciates relative to some currencies, the manufacturers concentrate their efforts on their traditional demand base in the national market. If the currency depreciates relative to other currencies, the price of a vehicle will be lower in foreign markets. There might also be cases where domestic sales are relatively 'insulated' from currency fluctuations.

We have investigated the relationship between the proportion of sales on the national market and the exchange rate to assess the extent to which the analysis that follows in the remainder of this report is being affected by currency fluctuations. Figure 5.3 and Table 5.2 show respectively the relationship between, and the correlation coefficient of, the proportion of sales made nationally against the ECU exchange rate for all manufacturers in a sample of EU Member States. In Figure 5.3, the left-hand axis shows the ECU exchange rate, the right-hand axis shows the proportion of total sales sold nationally. If the two lines representing these variables follow closely, it is reasonable to assume that currency fluctuations have affected trade.

Figure 5.3. Proportion of total sales sold nationally and ECU exchange rate, passenger cars, 1985–93



Source: Ward's, E&Y.

Table 5.2. Correlation coefficients of proportion of total sales sold nationally and ECU exchange rates, passenger cars, 1985–93

Germany	France	Italy	UK
0.42	-0.42	0.73	0.77

Source: E&Y.

Table 5.2 and Figure 5.3 suggest that for three of the four EU Member States, there is a positive correlation:

(a) As the Lira has devalued, Italian products have become cheaper, increasing sales abroad. The devaluation is highly correlated with a fall in the proportion of total sales sold nationally. The same has happened with Rover in the UK.

(b) As the German Mark has appreciated, VAG's national sales as a proportion of total sales have increased and non-domestic markets have become relatively less important. Whilst

German reunification has played a part in this increase in domestic sales, our interviews with the car companies confirmed that the role of currency fluctuations should not be understated.

(c) The French results are anomalous. The result for France can be explained by the fact that the French producers have increased their sales in foreign markets while the Franc has remained relatively stable against the ECU. Our case studies, for example, suggested deliberate strategies by Renault to develop their northern European markets and that the launches of the Twingo and Clio had been particularly successful in France. The success of this strategy and the stable Franc might explain the result presented above.

Naturally, there are a number of factors affecting manufacturers' share of sales sold in non-national markets and it appears that fluctuations in exchange rates are one of the factors which are playing an important part in determining the extent of a manufacturer's sales sold abroad. Just as it is difficult to observe and draw conclusions on the impact of the single market measures, it is also difficult to draw firm conclusions from the impact of exchange rates alone. This is further complicated by the fact that exchange rates have been subject to a wide number of macro-economic factors as well as the ERM. Nevertheless, any conclusions regarding the impact of the single market on trade should be guarded because of recent currency fluctuations coinciding with the implementation of the single market programme. This is confirmed by the fact that, in our case studies and interviews with trade associations, exchange rate fluctuations have been cited as a major factor in affecting recent trade between Member States.

This completes our pre-analysis. We now turn our investigation to the hypotheses relating to market access.

5.1.4. Hypothesis 1: Intra-EU trade at an aggregate level has increased

Expected impact

As barriers to entry are removed with the implementation of the single market programme, intra-EU trade is expected to increase. Manufacturers might have been prevented from selling their full range or maximizing sales because of barriers to trade. Removal of these barriers is likely to result in volumes of trade increasing. Our analysis which follows examines intra-EU trade at an aggregate level for both passenger cars and commercial vehicles.

Other factors

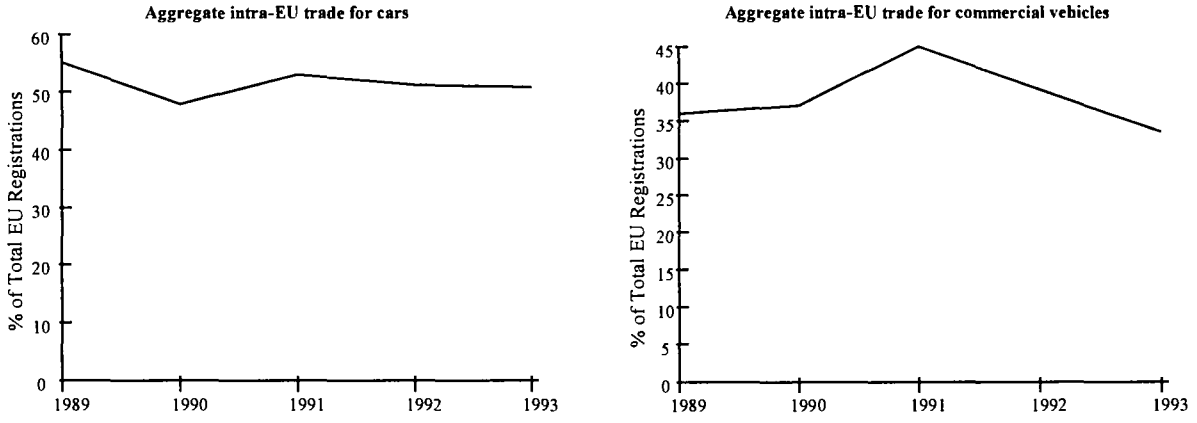
When examining effects in aggregate, it is likely that there may be some underlying factors which will not be observed. For example, German reunification is likely to have increased German manufacturers' domestic sales, reducing intra-EU trade. Meanwhile, other Member States might be increasing their intra-EU trade. The observed aggregate effect will not show these underlying changes. Other factors which are likely to be significant are increasing global competition, the relative impact of the recession on each Member State and new model launches. New model launches are expected to impact on Member States in different ways because of different launch dates and their level of appeal. New launches are likely to occur first in national markets and their appeal may well be greater than in non-traditional markets. Additionally, it is possible that consumers in aggregate react to economic decline and uncertainty by switching to national brands. Furthermore, cars could be bought in one Member State and registered in another, affecting our analysis. Finally, foreign direct investment might

stimulate and substitute for intra-EU trade flows. New plants in previous export countries will end trade flows, but production by this plant might increase trade flows out of this country.

Quantitative analysis

Figure 5.4 shows intra-EU trade in passenger cars and commercial vehicles for the period 1989–93. Unfortunately, as discussed in Section 4.3.1 further suitable official intra-EU trade data at this level of aggregation are not currently available. We attempted using SMMT data for 1994, but this proved fruitless since it gave inconsistent results compared to the Ward's data set.

Figure 5.4. Intra-EU trade for passenger cars and commercial vehicles as a percentage of total registrations, 1989–92



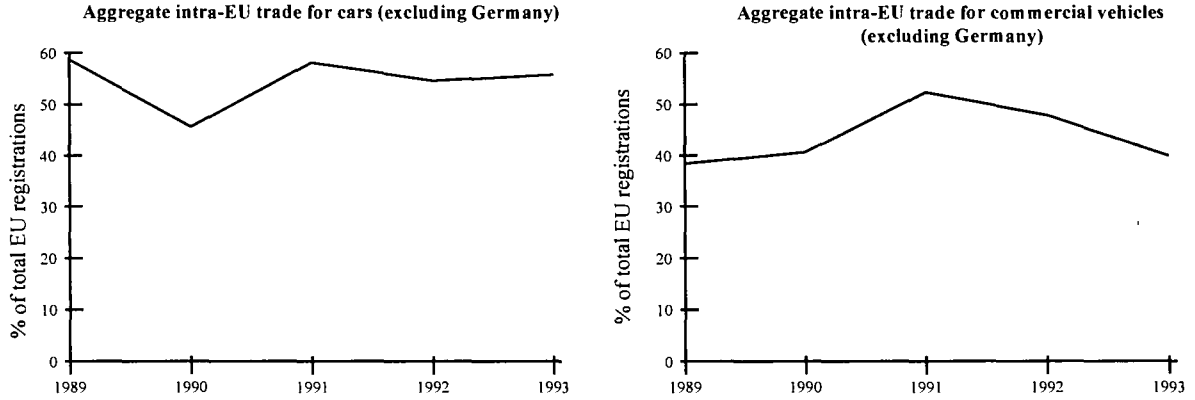
Source: Ward's.

Figure 5.4 shows:

(a) at this aggregate level, the intra-EU trade in passenger cars is very stable;
(b) commercial vehicle intra-EU trade reached a peak in 1991 and has declined since.

Because of the anticipated impact of German reunification on our results, we have carried out an additional analysis of the intra-EU trade in passenger cars and commercial vehicles for all EU Member States other than Germany. The results of this analysis are shown in Figure 5.5.

Figure 5.5. Intra-EU trade for passenger cars and commercial vehicles as a percentage of total registrations (excluding Germany), 1989–92



Source: Ward's.

Figure 5.5 shows:

(a) the shape of the charts is very similar to those in Figure 5.4;

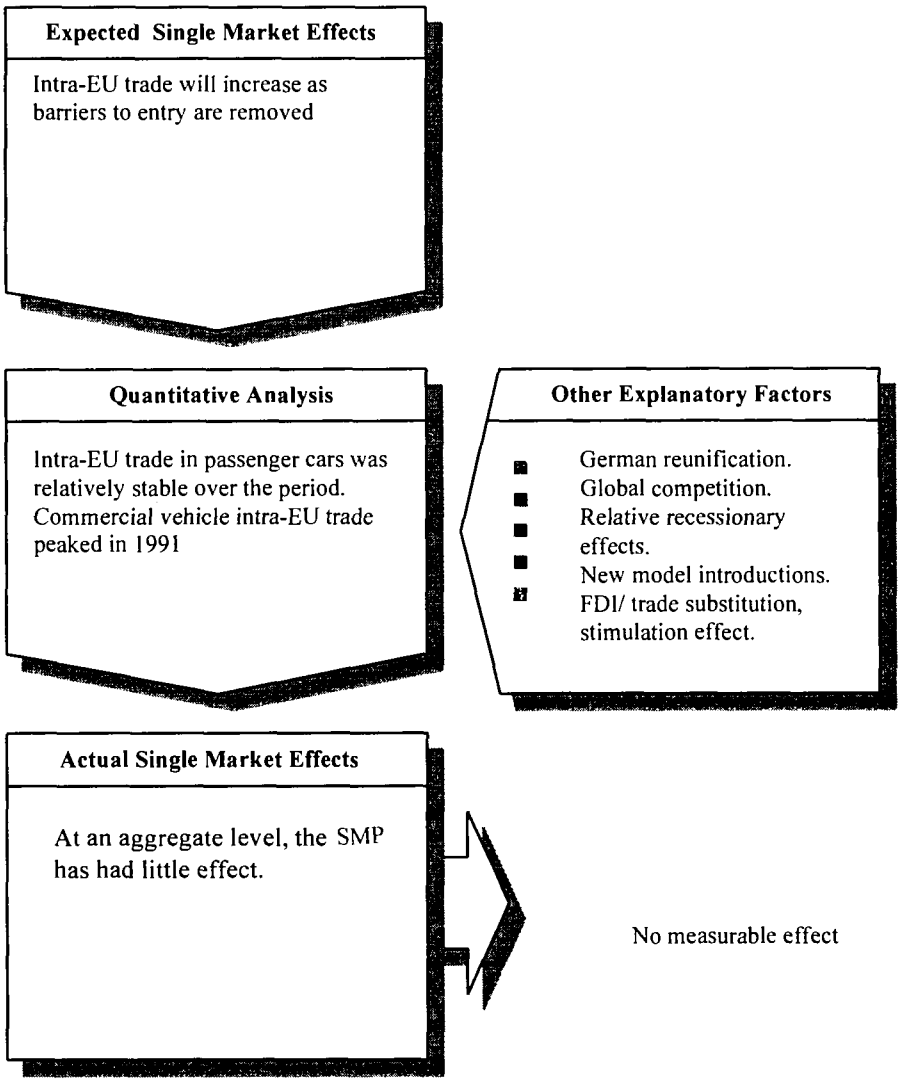
(b) the level of intra-EU trade for Member States other than Germany is generally higher than when Germany is included;

(c) the single market programme does not appear to have had an effect on the level of aggregate intra-EU trade for Member States other than Germany.

Actual impact

At the aggregate level of our analysis, it appears that intra-EU trade has not been affected by the single market programme. Analysis at a country level, and discussions with VDA, the German automotive industry trade association, confirmed that whilst most major automotive producing countries are increasing intra-EU trade, the reunification of Germany has resulted in German manufacturers increasing sales within their newly-expanded national market and reducing exports in relative terms. We cover this in more detail in Section 5.1.8. Discussions with companies in our case studies revealed that they consider increasing global competition, the recent Europe-wide recession and new model launches as far more important determinants of the degree of intra-EU trade than the single market programme. The counterfactual also applies here, but it is difficult to ascertain how different the observed aggregate changes might have been had the single market not been implemented.

Figure 5.6. Summary diagram 1: Hypothesis 1



5.1.5. Hypothesis 2: From a national point of view, the degree of intra-EU trade relative to individual national consumption or production will increase

Expected impact

The implementation of the single market programme is expected to increase trade between EU Member States. Economists argue that the removal of physical and information barriers to trade result in more entry into the market. One would therefore expect to see more sales in one Member State originating from other Member States. Also, longer term investments in new plant should increase trade, for example, the VW–Ford plant in Portugal exports 90% of its output.

We have analysed the ratio of imports relative to consumption in a Member State and the ratio of exports relative to the production in a Member State. This analysis is sometimes referred to

as the Elzinga–Hogarty analysis. We explain this method in more detail in Appendix J. This analysis is recognized by the European Commission as a method of defining markets in competition cases and so it is particularly appealing here. The Elzinga–Hogarty analysis simply examines imports into a Member State over domestic consumption and exports out of a Member State out of total production. It is expected the single market programme will increase the degree of imports into a Member State from other Member States and increase the degree of exports from a Member State into other Member States. Both imports and exports are measured in terms of registrations. This is not a perfect measure of trade since not all exports are sold, but data on actual exports are not recorded. Similarly, figures on trade are recorded on a major manufacturing country basis. This restricts our analysis to Germany, France, Italy and the UK. Nevertheless, this sample of countries will provide a clear indication of whether import penetration and export intensities have increased as a result of the single market programme.

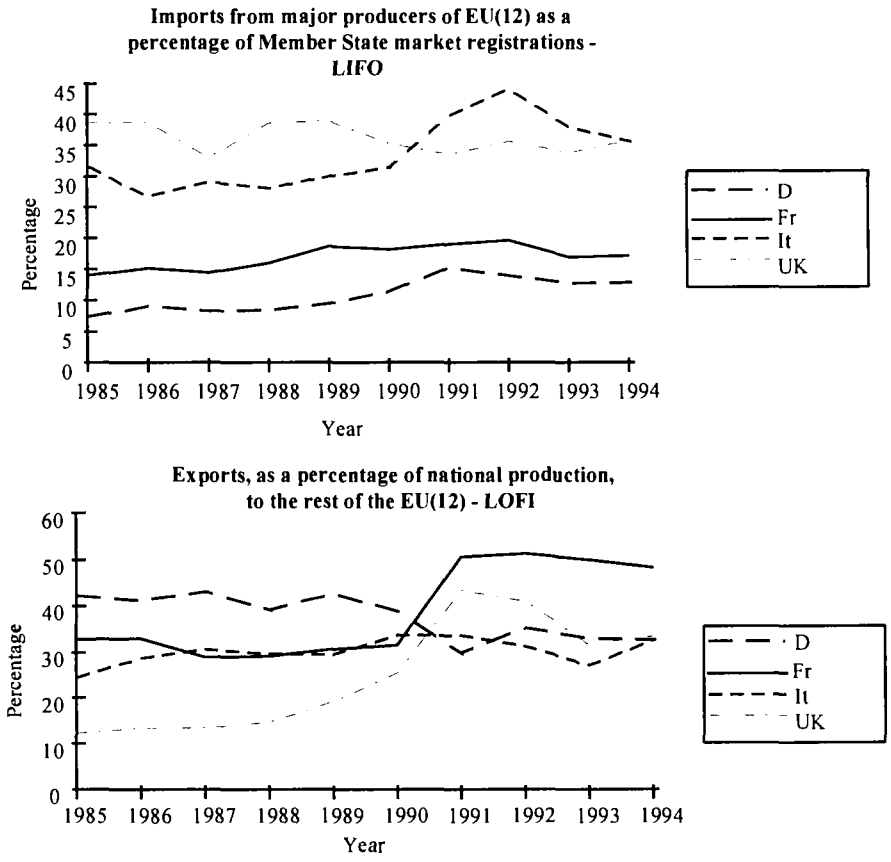
Other factors

As with the aggregate analysis, German reunification is likely to have an impact on the Member State analysis of intra-EU trade. The relative impact of the recent recession on demand in each of these Member States will also need to be considered. Our analysis in Section 5.1.3 suggested that the greater impact of the recession in one Member State relative to other Member States will affect the degree of imports into that Member State and the level of exports from it. Consideration will also need to be taken of the fact that successful new model launches will result in surges of foreign demand. Finally, currency fluctuations are likely to affect the attractiveness of one Member State's product relative to another. If a country experiences a devaluation in its currency, its products will become cheaper relative to foreign products, affecting both imports into and exports from the Member State.

Quantitative analysis

Elzinga–Hogarty specify two criteria: 'little in from outside' (LIFO), meaning that imports into the Member State are small; and 'little out from inside' (LOFI), meaning that exports from the region are small. Figure 5.7 shows the LIFO and LOFI tests separately. In both cases we have restricted our analysis to the largest four producing countries – Germany, France, Italy and the UK.

Figure 5.7. Trends in intra-EU trade by Member State, 1985–93



Sources: E&Y, CAIR.

(a) The LIFO chart shows that imports as a percentage of Member State total registrations is increasing slightly. This is consistent with our expectation of the impact of the single market programme. For example, Italian imports increased from approximately 33% to 37% between 1990 and 1994. However, the increase in import penetration began well before the implementation of the single market programme.

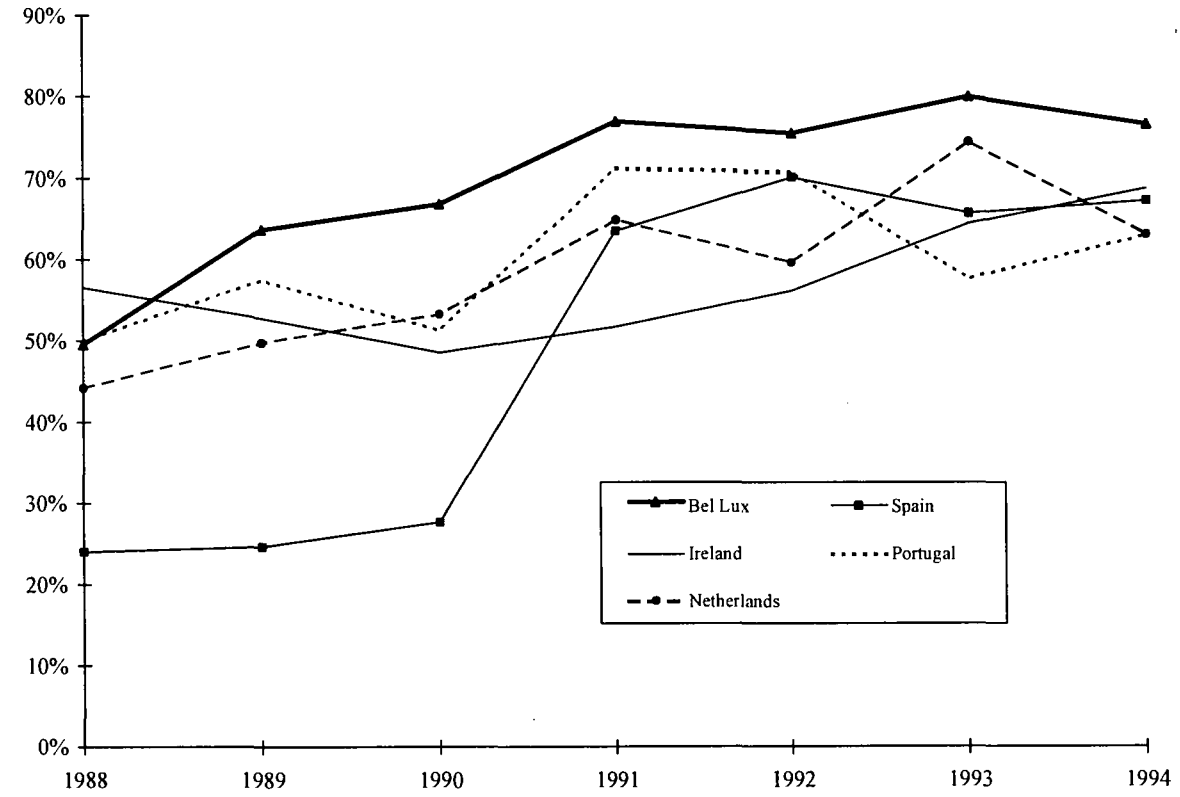
(b) Italy and the UK have had a consistently higher import penetration than France and Germany.

(c) The LOFI chart shows the share of German exports as a percentage of national production declining, Italy's share remaining relatively flat and France's and the UK's share fluctuating although trending upward. The only period of relative stability for all of these countries is from 1991 onwards, whilst the single market programme was being implemented.

(d) The LOFI chart also shows that the shares of exports as a proportion of national production for each of these Member States are converging. This indicates that markets are moving together which is also consistent with the expected impact of the single market programme, since manufacturers in the same market are expected to react in the same way to external influences.

The LOFI/LIFO analysis above concentrates solely on the impact of the single market programme on the major producing countries. This analysis is complemented below by an examination of imports as a percentage of registrations into Belgium and Luxembourg, Spain, Ireland, the Netherlands and Portugal. The results of this analysis are shown in Figure 5.8.

Figure 5.8. Imports as a percentage of registrations, selected EU Member States, 1988–93



Source: SMMT.

Figure 5.8 shows that:

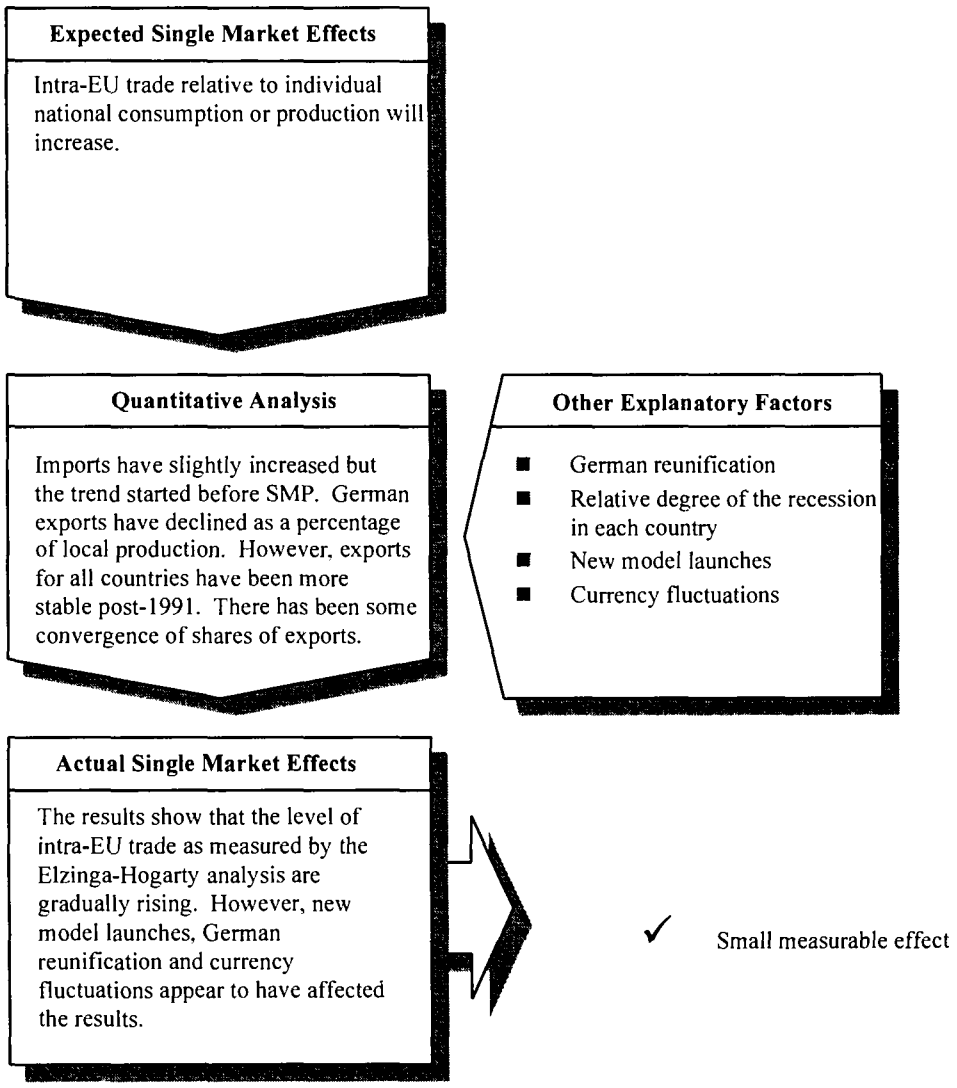
(a) in general, the trend of imports as a percentage of registrations is upwards;
(b) there does not appear to have been any dramatic change in 1993 as a result of the implementation of the single market programme;
(c) the results for Belgium and Luxembourg appear to have been affected by the fact that many manufacturers use these Member States as a distribution centre for the rest of the EU.

Actual impact

The degree of intra-EU trade appears to be trending up with more exports from the Member States. Similarly, imports appear to be trending up gradually as well. The results suggest that German reunification reduced the relative level of exports from Germany and reduced the relative level of imports into the country. This is consistent with our discussions with manufacturers and trade associations who said that reunification expanded the market

available to German manufacturers relatively more than other manufacturers because of the traditional appeal of the German marques to the former East Germans. Furthermore, the dip in (more expensive) imports into Italy directly coincides with the devaluation of the Lira. This runs in line with our analysis in Section 5.1.3 which found that currency fluctuations are likely to play a part in affecting trade between Member States. New model launches are also likely to have affected the quantitative analysis. For example, the launch of Mercedes' new E-class in 1992 sold particularly well in Germany, boosting Mercedes' sales in Germany and reducing the level of trade within the EU.

Figure 5.9. Summary diagram 2: Hypothesis 2



5.1.6. Hypothesis 3: Market shares across Member States will equalize

Expected impact

If all consumers across the EU could assess the same vehicles available to them based on the same price, information and availability then, putting to one side cultural differences and the suitability of vehicles for different countries (e.g. weather, road types, etc.), the market shares of manufacturers should be exactly the same in each of the Member States. Barriers to entry create distortions in price, information and availability, restricting the choice of vehicle available to consumers in different Member States and resulting in different Member State market shares for manufacturers. The removal of distortions in price, availability and information to consumers across the Member States as a result of the single market programme should bring manufacturer market shares closer together across the Member States. We would therefore expect to see a convergence in manufacturer market share in each Member State as the single market programme takes effect. In markets where manufacturers were relatively dominant we would expect their market share to decline and in markets where they had a relatively low presence we would expect their market share to increase. We explain this further in Appendix I.

This expected impact can be examined through an analysis of variance in market share across a number of Member States.

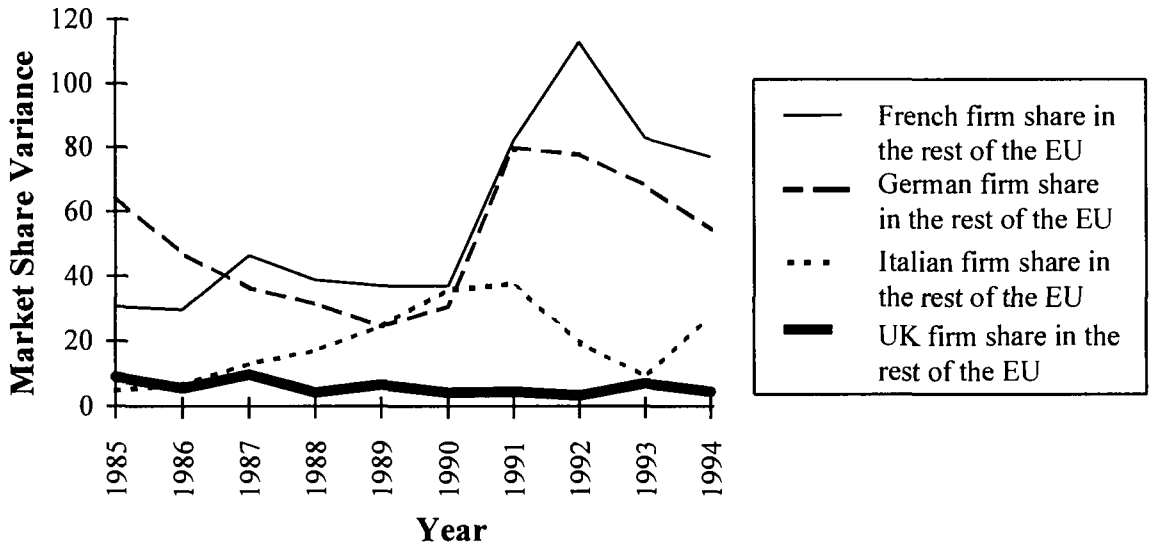
Other factors

Despite the expectation that market shares will equalize across Member States, there are other factors which will also affect the analysis. For example, new model launches are likely to be more popular in some Member States than in others. The differences in consumer taste across the Member States will result in different market shares. As with the previous hypothesis, the relative impact of the recent recession in each of the Member States will affect EU market shares. As the recession bites in a Member State, the national producer is likely to look more at the export market for its sales, increasing its market share in these other Member States. Currency fluctuations may also play an important part in the determination of market shares across the Member States. The counterfactual might also play a part in our analysis in that the variance observed might have been greater if the single market programme had not been implemented.

Quantitative analysis

Figure 5.10 shows the variance in passenger car market share for German, French, Italian and UK-based manufacturers in Belgium, Denmark, Germany, Spain, France, Greece, Italy, Ireland, the Netherlands, Portugal and the UK. For example, we have looked at the share of German exports in each of these other EU Member States over the period 1985–94. The higher the variance in market shares, the more disparate the share of sales of German exports in each of the other Member States, and vice versa.

Figure 5.10. Variations in a manufacturer's market share, 1985–93



Sources: E&Y, CAIR, SMMT

Figure 5.10. shows that:

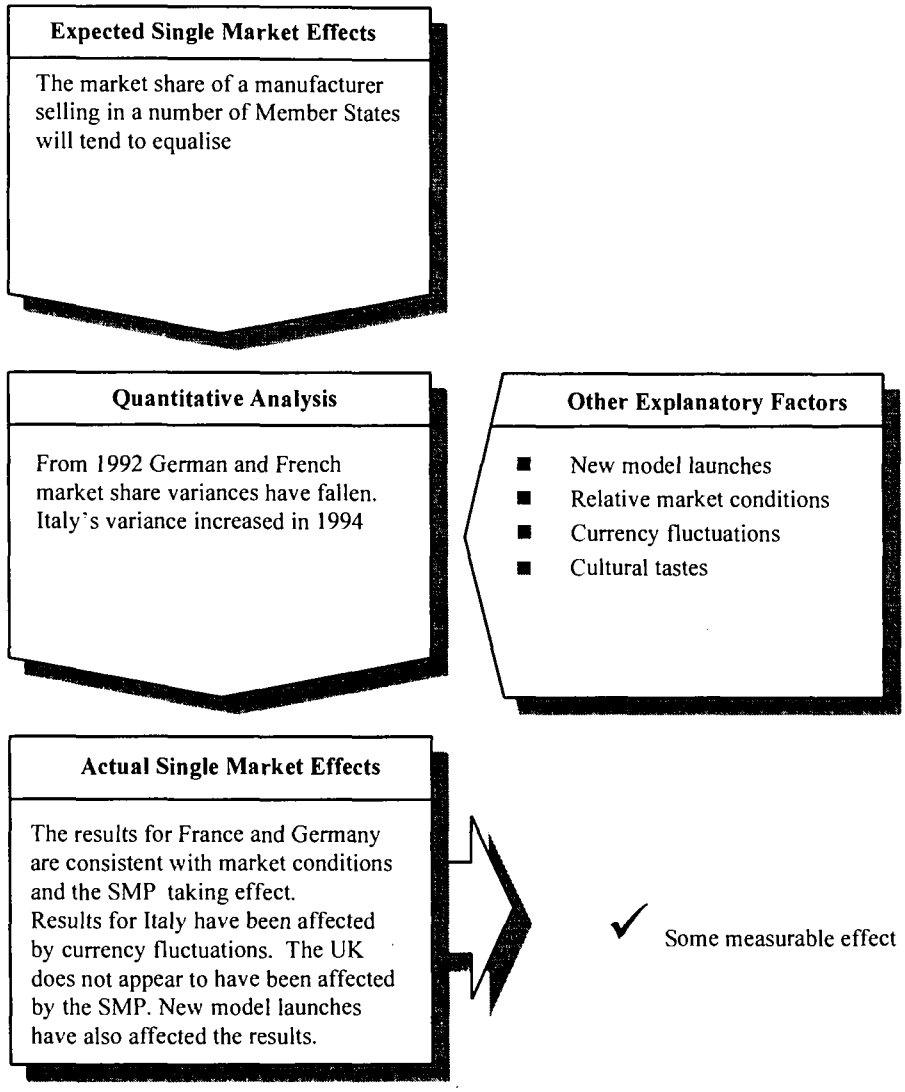
(a) The variance of shares is volatile over the period shown for all Member States, although less for manufacturers from the UK and Italy. Relative market conditions, as analysed in Section 5.3.1, are probably playing a part in this.

(b) From 1992, the variance in market share of French and German manufacturers has fallen rapidly. For France, the variance in market shares fell by approximately 20% during the period 1992–94. The trend in variance for Italy is declining markedly from 1991, but rises in the last year of the period, largely due to the devaluation of the Lira. The variance for the UK is low throughout the period.

Actual impact

Our results for France and Germany are consistent with our expected impact of the single market programme. Market conditions also appear to be having an effect on the variance of market shares. There has been a definite reversal in the upward trend in variance of market share for these countries. Our results for Italy appear to have been affected by currency instability. It is also likely that new model launches play a part in the observed variance of market shares across the Member States.

Figure 5.11. Summary diagram 3: Hypothesis 3



5.1.7. Hypothesis 4: The number of makes and model variants available will increase

Expected impact

The implementation of the single market programme and the removal of barriers to entry between the EU Member States might have affected companies' entry strategies in terms of the number of variants and models they trade to certain markets. This will boost consumer surplus at the expense of producer surplus through wider product choice.

Market access improvements are likely to have resulted in reductions in the manufacturers' costs of new model launches and variant requirements, increasing the likelihood that wider product entry into foreign markets will occur. A greater number of models and variants would therefore be consistent with our expectation of the impact of the single market programme. Or,

to put it another way, there will be greater total choice (i.e. more models available) and the market share of dominant local models will decline.

Other factors

The development of more models by the automotive manufacturers is likely to be partly as a consequence of increasing competition in the global automotive market, and has been a part of automotive history from Alfred T. Sloan's strategies in General Motors from the 1930s onwards. A classic response to increased competition is to produce more differentiated products. This greater product diversity is also a likely consequence of a more sophisticated and knowledgeable consumer in the EU Member States.

Quantitative analysis

Tables 5.3 to 5.10 show the top ten best-selling cars in Belgium, Germany, Spain, France, Italy, Portugal, Sweden and the UK in 1989 and 1994 (1995 figures available for Belgium, Germany, France, and Portugal).

Table 5.3. Best selling cars in Belgium, 1989 and 1995

Rank	Model	% of market	Rank	Model	% of market
1989			1995		
1	VW Golf	6.4	1	VW Golf/Vento	7.8
2	GM Opel Kadett	4.9	2	GM Opel Astra	4.6
3	Peugeot 205	3.6	3	VW Polo	3.5
4	Toyota Corolla	3.4	4	Ford Escort	3.1
5	Renault 19	3.3	5	Ford Mondeo	3.1
6	Renault 5	3.2	6	Ford Fiesta	3.0
7	Peugeot 405	3.1	7	BMW 3-Series	2.9
8	Ford Fiesta	3.1	8	Renault Clio	2.7
9	Ford Escort	2.8	9	GM Opel Corsa	2.7
10	GM Opel Corsa	2.7	10	Renault 19	2.5
		36.5			35.9

Source: AID/FEBIAC.

Table 5.4. Best selling cars in Germany, 1989 and 1995

Rank	Model	% of market	Rank	Model	% of market
	1989*			1st half of 1995	
1	VW Golf	11.4	1	VW Golf/Vento	11.3
2	GM Opel Kadett	7.6	2	GM Opel Astra	6.8
3	VW Passat	5.5	3	Audi A4/80	4.6
4	Mercedes W124	4.7	4	BMW 3-Series	4.4
5	GM Opel Vectra	4.1	5	Mercedes C-class	4.2
6	Audi 80/90	3.8	6	GM Opel Corsa	3.8
7	BMW 3-Series	3.3	7	Ford Escort	3.7
8	Mercedes 190	3.3	8	Ford Fiesta	3.6
9	Ford Escort	2.9	9	VW Polo	3.5
10	Ford Fiesta	2.8	10	VW Passat	3.3
		49.4			49.2

Source: KBA/AID.

* 1989 figures relate to West Germany only.

Table 5.5. Best selling cars in Spain, 1989 and 1994

Rank	Model	% of market	Rank	Model	% of market
	1989			1994	
1	Renault 19	7.8	1	Ford Escort	6.0
2	GM Opel Kadett	7.7	2	GM Opel Corsa	5.9
3	Seat Ibiza	6.3	3	GM Opel Astra	5.6
4	Renault 5	5.6	4	Ford Fiesta	5.5
5	Ford Fiesta	5.4	5	Renault Clio	5.1
6	GM Opel Corsa	5.1	6	Seat Ibiza	4.9
7	Citroën AX	5.0	7	Renault 19	4.6
8	Peugeot 205	4.3	8	Peugeot 306	4.4
9	Renault 21	3.6	9	Citroën ZX	4.3
10	Ford Orion	3.5	10	VW Golf	3.2
		54.3			49.5

Source: AID/ANFAG.

Table 5.6. Best selling cars in France, 1989 and 1995

Rank	Model	% of market	Rank	Model	% of market
	1989			1995	
1	Renault 5	10.4	1	Renault Clio	8.8
2	Peugeot 205	9.7	2	Peugeot 306	6.2
3	Renault 19	7.7	3	Peugeot 106	6.0
4	Peugeot 405	6.4	4	Renault Twingo	5.8
5	Renault 21	6.2	5	Renault Laguna/21	4.6
6	Citroën AX	6.1	6	Renault 19	4.5
7	Citroën BX	4.6	7	Citroën ZX	4.4
8	Peugeot 309	4.1	8	Citroën AX	3.8
9	VW Golf	3.8	9	Citroën Xantia	3.5
10	Ford Fiesta	2.9	10	Ford Fiesta	3.3
		61.9			50.9

Source: AID/industry sources.

Table 5.7. Best selling cars in Italy, 1989 and 1994

Rank	Model	% of market	Rank	Model	% of market
	1989			1994	
1	Fiat Uno	16.2	1	Fiat Punto	12.4
2	Fiat Tipo	11.1	2	Fiat Uno	6.0
3	Fiat Panda	9.5	3	Fiat Cinquecento	4.7
4	Lancia Y10	5.3	4	Ford Fiesta	4.4
5	VW Golf	3.6	5	VW Golf	4.4
6	Renault 5	3.2	6	Fiat Panda	4.1
7	Peugeot 205	2.9	7	Fiat Tipo	4.0
8	Alfa Romeo 33	2.7	8	Autobianchi Y10	3.5
9	Citroën AX	2.3	9	Opel Astra	3.3
10	GM Opel Kadett	2.3	10	Peugeot 106	3.3
		59.1			46.1

Source: ANFIA/industry sources.

Table 5.8. Best selling cars in Portugal, 1989 and 1995

Rank	Model	% of market	Rank	Model	% of market
1989			1995		
1	Fiat Uno	9.0	1	Opel Corsa	12.4
2	GM Opel Corsa	9.0	2	Fiat Punto	12.4
3	Renault 5	7.7	3	Renault Clio	7.6
4	Renault 19	7.3	4	Ford Fiesta	5.4
5	Ford Fiesta	5.8	5	Peugeot 106	5.0
6	Citroën AX	5.4	6	Opel Astra	4.5
7	VW Golf	4.8	7	Seat Ibiza	3.4
8	Peugeot 205	3.9	8	Renault 19	3.3
9	Seat Ibiza	3.5	9	Citroën AX	2.9
10	Fiat Tipo	3.4	10	VW Golf	2.4
		59.8			59.3

Source: AID/ACAP.

Table 5.9. Best selling cars in Sweden, 1989 and 1994

Rank	Model	% of market	Rank	Model	% of market
1989			1994		
1	Volvo 700	13.2	1	Volvo 800	8.8
2	Saab 9000	4.7	2	Volvo 700/900	6.1
3	Volvo 200	3.9	3	Saab 900	6.0
4	Volvo 400	3.9	4	Ford Escort	5.8
5	GM Opel Kadett	3.8	5	VW Golf/Vento	5.3
6	VW Golf	3.7	6	Ford Mondeo	5.0
7	Saab 900	3.7	7	Volvo 400	4.4
8	Ford Sierra	3.6	8	Saab 9000	3.5
9	Toyota Corolla	3.3	9	Opel Astra	3.5
10	Audi 100/200	3.1	10	Toyota Corolla	3.4
		46.9			51.8

Source: ANFIA/Industry Sources.

Table 5.10. Best selling cars in the UK, 1989 and 1994

Rank	Model	% of market	Rank	Model	% of market
1989			1994		
1	Ford Escort	7.9	1	Ford Escort	7.5
2	Ford Sierra	7.6	2	Ford Mondeo	6.7
3	Ford Fiesta	6.5	3	Ford Fiesta	6.5
4	GM Cavalier	5.7	4	Rover 200/400	5.8
5	GM Astra	5.1	5	GM Cavalier	5.2
6	Rover Metro	4.3	6	GM Astra	5.1
7	GM Nova	3.1	7	GM Corsa/Nova	4.1
8	Ford Orion	3.0	8	Rover Metro	3.1
9	Rover 200	3.0	9	Renault Clio	2.6
10	Rover Montego	2.5	10	Peugeot 306/309	2.6
		48.7			49.2

Source: AID/industry sources.

The tables show that the proportion of the market accounted for by the top ten has fallen in all cases except in the UK and Sweden. Despite the slight increase in share held by the top ten models in the UK, it is interesting that the number of different companies represented have increased with the addition of a Renault and a Peugeot vehicle. Moreover, there is a clear trend showing that the share held by the top model, whatever that model is, has fallen in virtually every case. This indicates that the competition faced by the incumbent manufacturers in 1989 has increased by 1994/95. Portugal is the exception to this trend, perhaps as a result of a particularly successful advertising campaign for the Corsa in this market.

These results only indicate that more models are available, reducing the share held by the best sellers in each of the Member States. We have gathered additional data:

(a) between 1986 and 1993, the number of models sold in the German market jumped by 50% from 44 to 66;
(b) the number of models and variants sold in France has risen by 47% from 515 in 1986 to 758 in 1993.

Renault pointed out that there is no contradiction between platform rationalization and model proliferation, since many models can be made from the same platform. We discuss changes in production techniques later in Chapter 6.

Actual impact

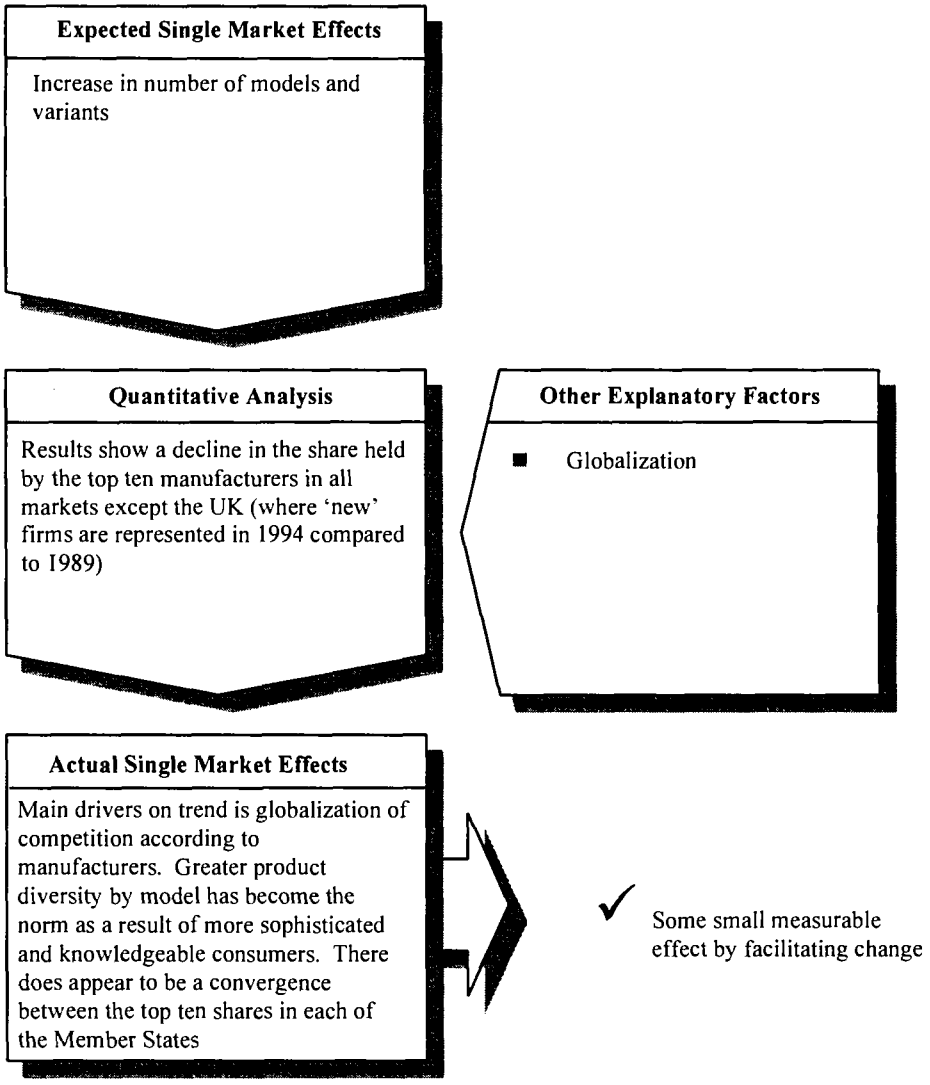
Germany and the UK had relatively open markets in 1989, both with a share for the top ten makes of around 49%. In comparison, the relatively closed markets (to the Japanese) of Italy and France resulted in a larger share for the top ten makes in 1989. By 1994/95, this picture has dramatically changed. The relatively open markets of Germany and the UK have seen little change in the share held by the top ten makes. In France and Italy, the share held by the top ten cars have both fallen to around the 'open level'. This is probably partly because of the single

market programme. Therefore, the analysis presented in Tables 5.3 to 5.10 is consistent with the expected effect of the single market programme.

Nevertheless, the results are also consistent with the facts that increasing global competition and more sophisticated consumers have resulted in a more diverse production of models. For example, 30 years ago, Renault were producing a world car, the *Dauphine* at similar levels of output to the *Clio* today. The principal change is in the level of competition which has resulted in an increase in the number of models in each model class. In the 1950s there was usually only one model by class. Now, there are usually four models in each class of car (coupe, hatchback, estate and saloon). This has resulted in a decrease in share for each model as they become increasingly differentiated. Renault do not believe that the single market programme has played any part in the increased numbers of models available. Despite this, the counterfactual needs consideration. It is likely that without the development of the single market programme some EU Member States would have continued to protect their domestic markets for longer. The proliferation of different brands and variants available in these Member States is unlikely to have been as well advanced as it now is had the single market programme not been implemented.

At best, the single market programme can be said to have facilitated increasing competition in the automotive industry which, in turn, has increased the number of models available to the consumer and is likely to have reduced the share held by the top ten models.

Figure 5.12. Summary diagram 4: Hypothesis 4



5.1.8. Hypothesis 5: The proportion of EU-owned automotive manufacturers' national sales relative to non-national sales will fall

Expected impact

As noted in Section 4.3.2, given the method of presenting manufacturing output and sales, for ease of analysis we have to treat the national market as the traditional base of the firms involved, such as Germany for VAG and France for Renault. For the same reasons, we have not examined GM Europe and Ford Europe in this analysis because the definition of national and non-national sales for these companies becomes even more confusing. This is not, however, to say that any observed effects for the other manufacturers will not also apply to these US-owned manufacturers.

As the single market programme eases trade between Member States, the relative share of the automotive producers' total production which is traded between Member States is likely to increase and/or there will be production in new locations.

Barriers to entry reduce information, price and availability and they therefore restrict competition between manufacturers. We would therefore expect the removal of barriers to entry with the implementation of the single market programme to have two effects on manufacturers' share of their national marketplace relative to sales in other markets:

(a) the share of national sales as a proportion of total sales falls as new competitors enter the market and existing competitors increase sales in the market;
(b) the national manufacturer might switch its attention from the home market in order to both exploit new markets which have become more viable for entry and maintain overall sales as competition in the national market increases.

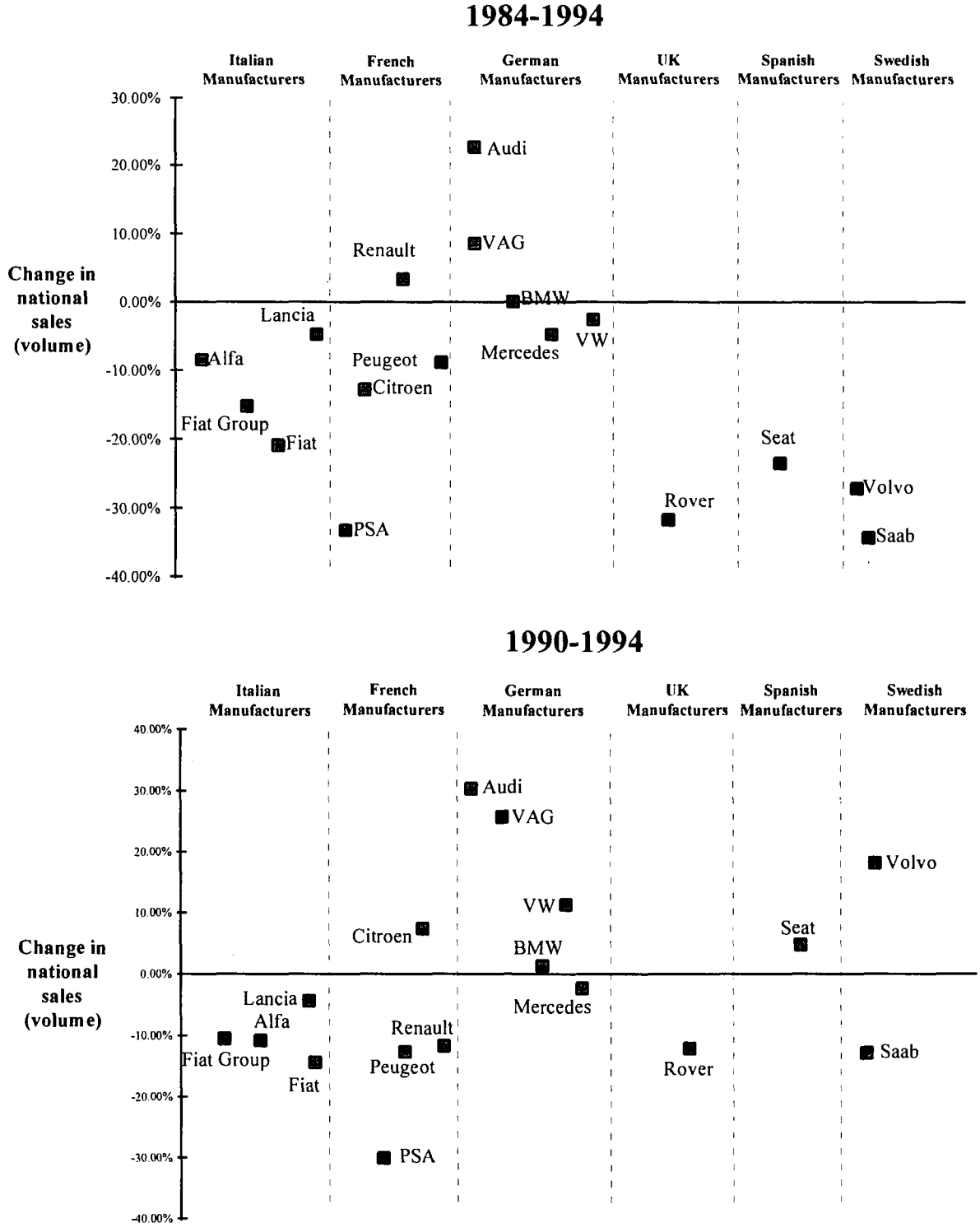
Other factors

As with our previous analyses on intra-EU trade, the relative market conditions in different Member States and currency fluctuations are likely to play a part in this analysis. Similarly, the relative popularity of new model launches is also likely to influence national sales relative to non-national sales. The analysis for Germany could also be affected by German reunification.

Quantitative analysis

Figure 5.13 shows the change in EU-owned manufacturers' share of national sales as a proportion of total sales, over the longer time series of 1984–94 and over the shorter time span of 1990–94, for passenger cars. A reduction of national sales as a proportion of total sales from 40% to 20% is described as a 50% reduction in share. The main source of data for this analysis was Ward's which provided data up to 1993 and was supplemented by new data from SMMT for 1994. The countries covered for this analysis are Spain, Germany, France, Italy, Sweden and the UK. Data on production from other states such as Belgium were not available. Nevertheless, this analysis should provide a clear picture of whether the single market has had an effect since a good cross-section of producers and Member States has been analysed.

Figure 5.13. EU manufacturers' change in national sales (volume) of passenger cars as a proportion of total passenger car sales, 1984–94 and 1990–94

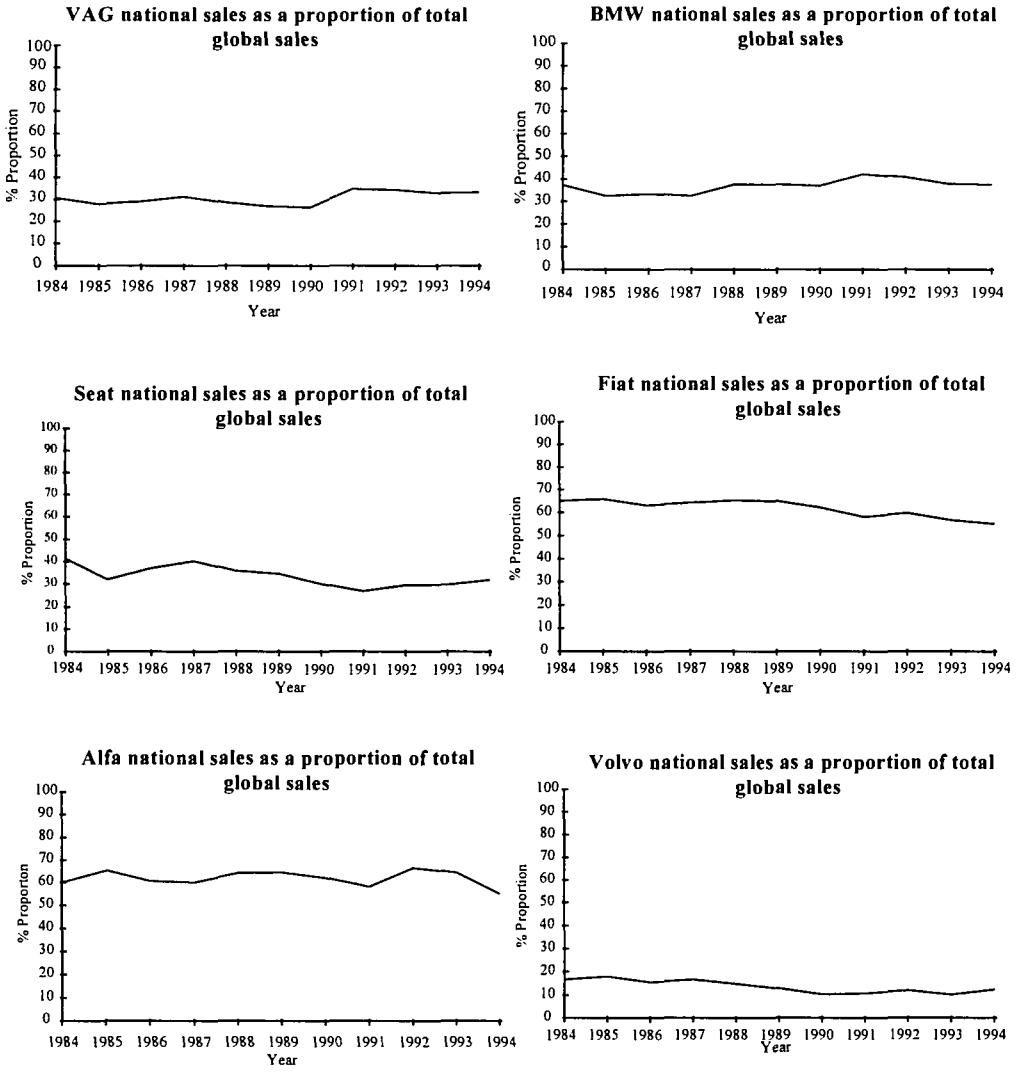


Sources: E&Y, Ward's, 1994, SMMT, 1995.

The first chart shows that, on the whole, the proportion of sales in Member State national markets of EU-based automotive manufacturers has declined over the ten-year period. This is consistent with our hypothesized effects of the single market programme. However, close examination of the chart for 1990–94 gives a more mixed picture with some manufacturers' national market sales as a proportion of total sales increasing. In particular, the German-owned manufacturers have increased this proportion. There appears to be a clear distinction between the volume/full range producers (Fiat, Renault, PSA, Rover and VAG) whose shares have declined, and the specialist producers such as BMW and Mercedes whose shares have increased or fallen by less. Other than Germany, there does not appear to have been any particular Member State effect (such as the opening up of the relatively more closed French and Spanish markets).

Figure 5.14 shows a selection of EU-owned manufacturers and illustrates the change in the relationship between national and non-national sales. The selection of firms shows a number of manufacturers from a number of Member States and covers both volume and specialist manufacturers.

Figure 5.14. National sales (volume) as a proportion of total global passenger car sales for a sample of individual companies, 1984–93



Sources: Ward's 1994, SMMT.

Figure 5.14 shows that:

(a) Some shares have fallen significantly such as Fiat, Volvo and Seat, while others have increased, such as BMW and VAG. Alfa's share has fluctuated but remains around the same in 1994 as it was in 1984.

(b) For German manufacturers, the likely single market programme impact might have been affected by German reunification, reflected by the increases in the share of national sales as a proportion of total global sales. Their better performance might also be a reflection of better products.

Actual impact

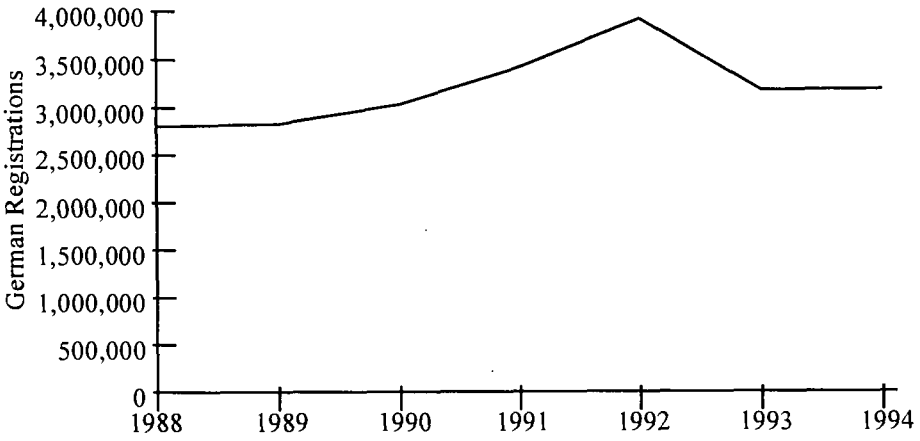
There is little evidence to support the hypothesis that the single market programme has reduced the importance of domestic sales as a proportion of total global sales for EU-owned

automotive manufacturers. We spoke to a number of car manufacturers about these trends and their view was that the changes were primarily a result of new product launches. For example, Mercedes said that the launch of the new E-class played a part in their improved domestic market position. However, it is normal in field research for manufacturers to focus on their own actions and successes rather than on macro-economic changes. Appendix P provides a more detailed description of the results of this research.

The second chart of Figure 5.14 gives a clear indication that some countries' manufacturers have been affected more by the single market programme than others and that other factors can have a significant impact on our results. The German-based automotive manufacturers all increased their national share of sales relative to total sales. German reunification is likely to have played a substantial part in these results.

Figure 5.15 shows the number of 'German' registrations between 1988 and 1994. While much of Europe experienced a slump in registrations between 1990 and 1992, Germany experienced an increase. As Figures 5.13 and 5.14 show, German manufacturers were the main beneficiaries.

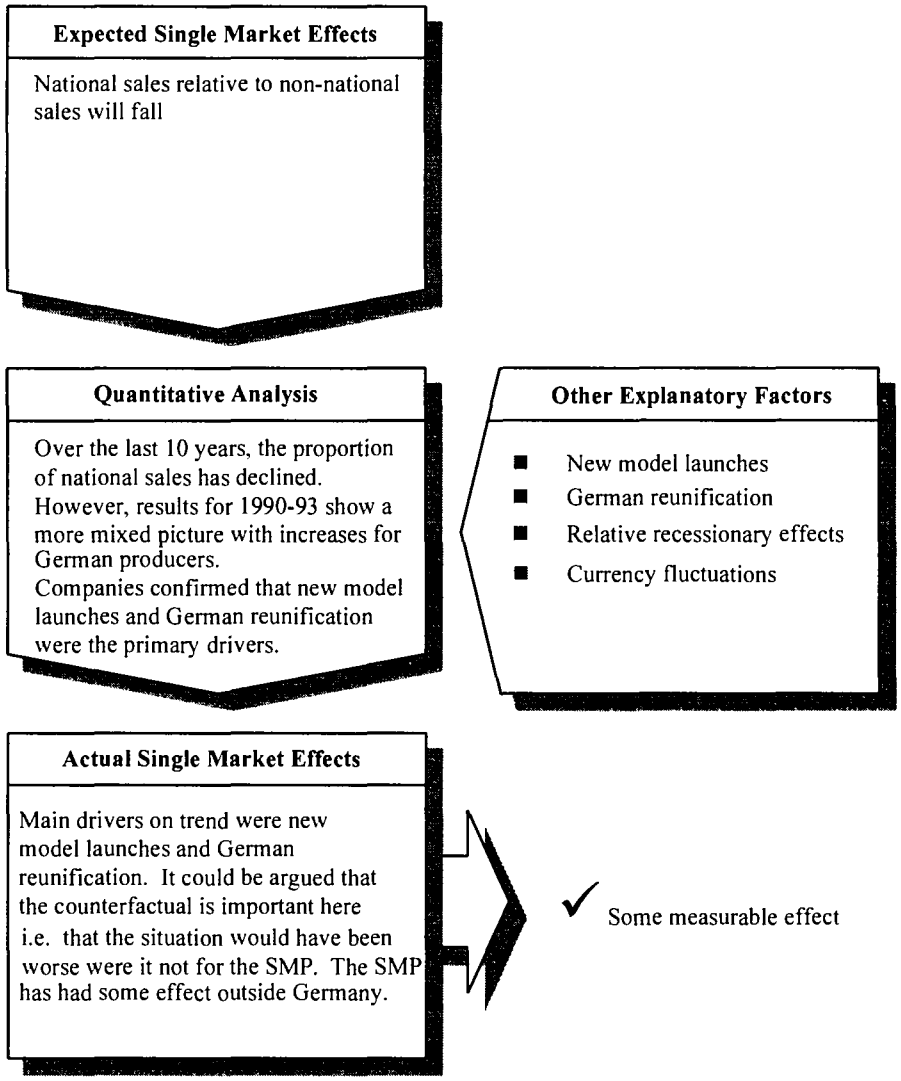
Figure 5.15. Impact of reunification on number of German registrations (data include former East Germany from 1992), 1988–93



Source: SMMT.

When the Berlin Wall fell in 1989 a beneficial Ostmark:Deutschmark exchange rate led to a boom in East German demand for second-hand West German cars. This pushed up the price of used cars, resulting in increased West German demand for new cars. Following reunification, 'East' German demand for new cars, particularly small cars, then grew rapidly. German output was redirected towards the domestic rather than the export market because the demand for German cars allowed the producers to maintain full production capacity despite the recession in the rest of the EU. In addition, German manufacturers could recruit dealers more quickly than they would in a normal entry strategy into a Member State which did not share the same language. BMW and Mercedes confirmed that the 1990 improvement in their domestic position relative to the rest of the world was partly as a result of new sales opportunities from East Germany. Between 1992 and 1994, Germany experienced the recession which reunification had delayed.

Figure 5.16. Summary diagram 5: Hypothesis 5



5.1.9. Hypothesis 6: The share of the national marketplace for each manufacturer will fall

Expected impact – national market share

As discussed in Section 4.3.2, the national market is the base market of the automotive producer even though they may have plants in many other countries around the EU and the world. Therefore, on the assumption that the national producer is at least fairly reliant on the national market for sales, we would expect national market share to fall. Removal of barriers to entry is expected to lead to increased competition for automotive manufacturers in their national markets. This will be reflected in lower national market shares as new and old competitors no longer face barriers to entry affecting price, availability and information about alternative products. The national market may be the relevant market for many EU automotive producers, but is likely to become less valid as many of the automotive manufacturers adopt a

more global strategy for production and sales. In recognition of this fact, we examine their share of both national markets and the wider EU market.

Other factors

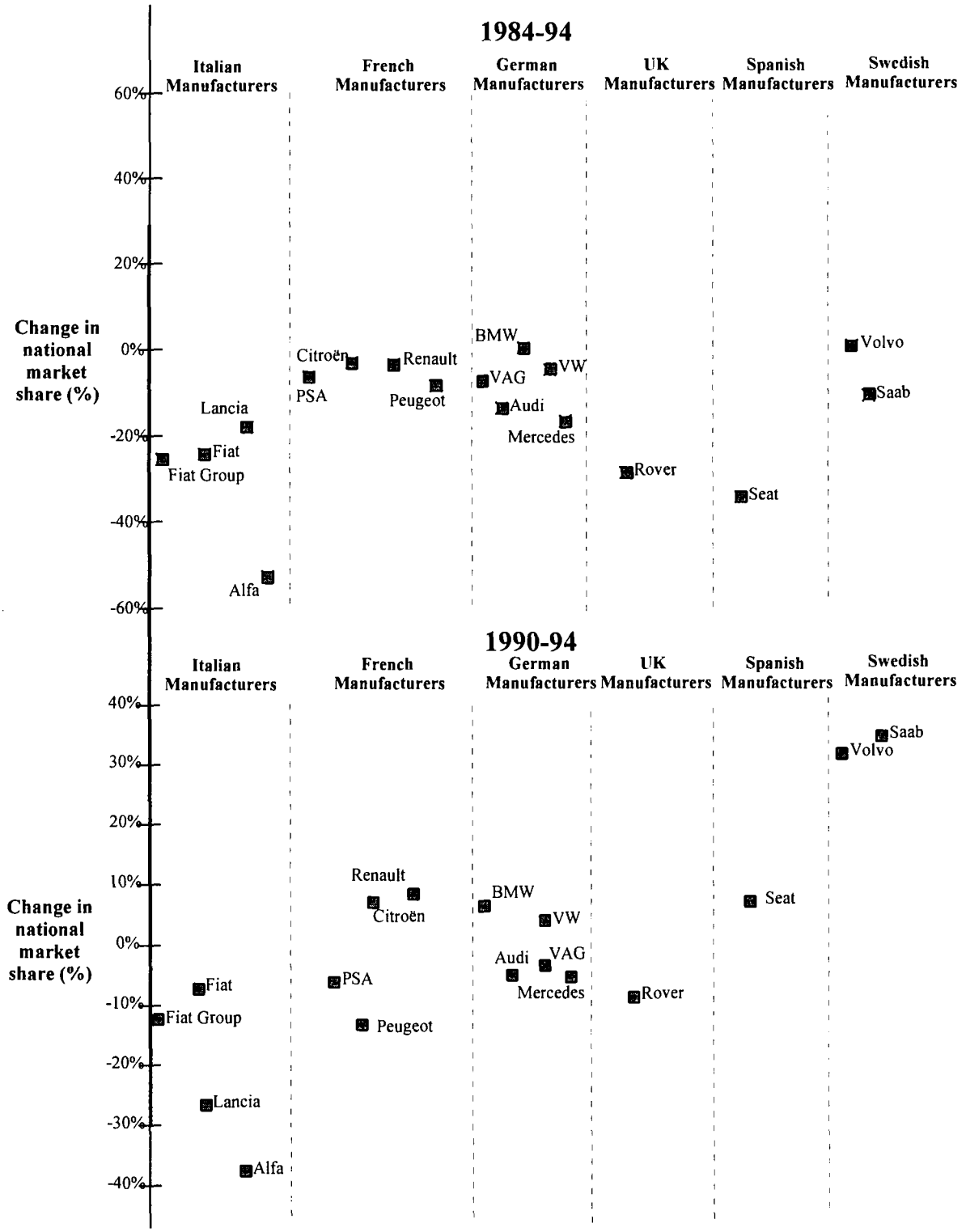
The other factors which are likely to affect our analysis are the same as in the previous hypothesis. Currency fluctuations and the relative impact of the recession in different Member States are likely to play a part in this analysis. Similarly, the relative popularity of new model launches are also likely to influence national sales relative to non-national sales. The analysis for Germany could also be affected by German reunification. In addition, increasing globalization of competition will place a downward pressure on national market shares.

Quantitative analysis – national market share

The charts in Figure 5.17 show the change in national market share for the major EU automotive manufacturers, again over the periods 1984–94 and 1990–94. For example, if a company's national share fell from 40% to 20%, then we would describe this as a 50% decline. The data used in this analysis were primarily from Ward's, providing data up to 1993. These data were then supplemented by new data from SMMT. The countries covered for this analysis are Spain, Germany, France, Italy, Sweden and the UK. Data on production from other states such as Belgium were not available. Nevertheless, this analysis should provide a clear picture of whether the single market has had an effect since a good cross-section of producers and Member States has been analysed.

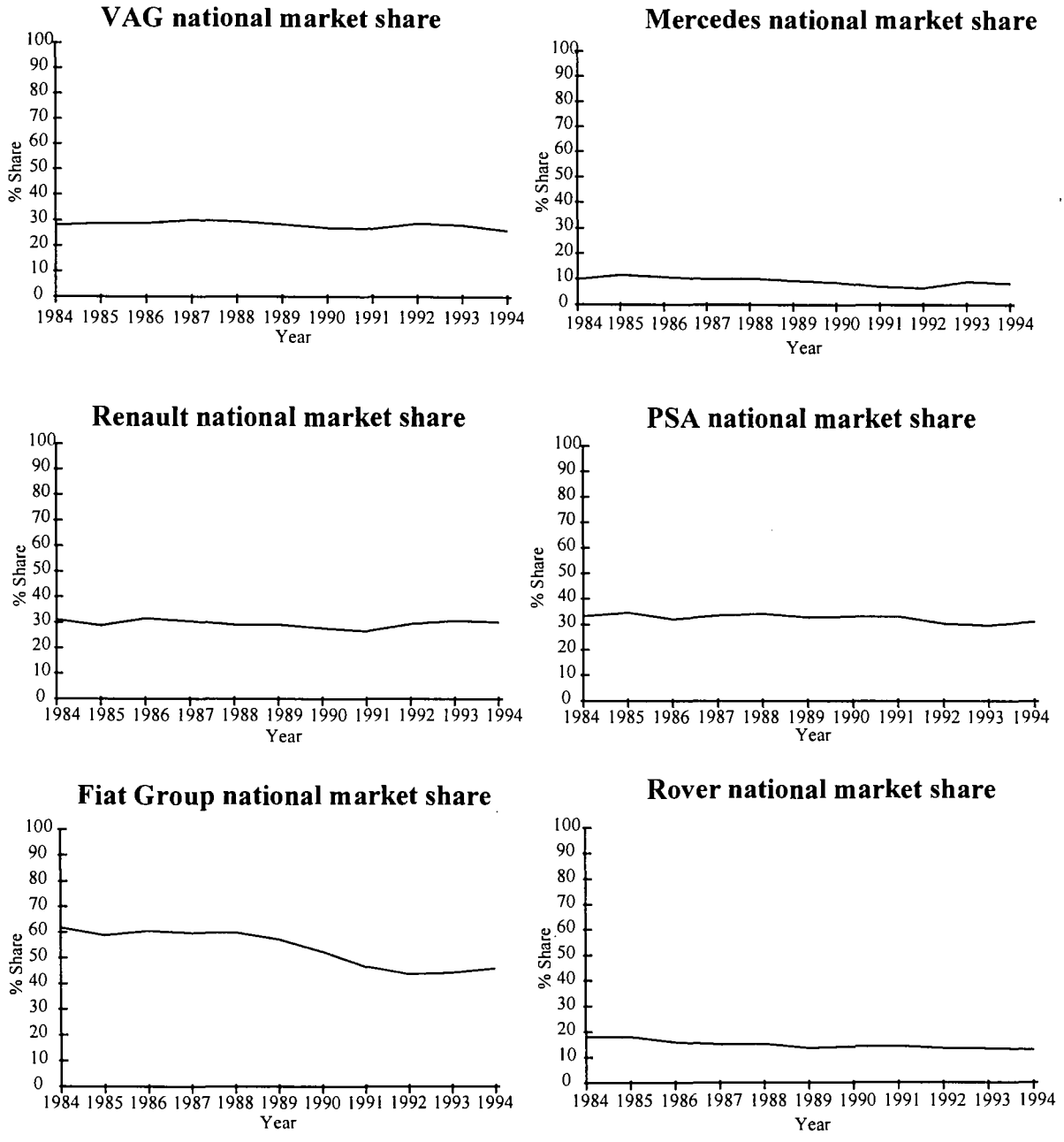
The chart for 1984–94 shows that nearly all manufacturers' shares fell, some by more than half. During the period 1990–94 (as some of the measures in the single market programme were being implemented), the picture is more complex, since the German and French manufacturers saw some shares increase and some fall, while the Italian manufacturers' national shares fell.

Figure 5.17. Change in share of national market for passenger cars (volume), 1984–94 and 1990–94



Sources: Ward's, 1994, SMMT, 1995.

Figure 5.18. National market shares (volume) for a sample of individual companies, passenger cars, 1984–93



Sources: Ward's, 1994, SMMT 1995.

Figure 5.18 illustrates market share for a sample of EU automotive manufacturers over the period 1984–93:

(a) Fiat Group and PSA Group, volume manufacturers of cars, have seen their national market shares eroded during the ten-year period. Much of these losses occurred in the last four years, coinciding with both the single market programme and recession.

(b) It is likely that volume producers, which tend to pitch their production at the peak of the business cycle, have excess supply in times of recession. It is possible, therefore, that

volume manufacturers may seek to offset the falls in demand in national markets by greater sales in non-national markets.

(c) In contrast, Renault, another volume manufacturer, suffered from a fall in share from 1986 but has since regained the ground it lost. This may be due to the launch of more competitive products such as the Renault Clio.

(d) The results for VAG are complicated by the reunification of Germany, as discussed in Section 5.1.4, which was an important external shock on the performance of German manufacturers.

(e) Mercedes and Rover show a gradual decline over the period. Mercedes said that the pick-up in 1993 was related to the anticipation of new German emission regulations. This illustrates the impact that rational expectations can have on our observed results, since Mercedes acted on anticipated policy changes well before the implementation, smoothing out the effect over a longer period of time.

Appendix H provides the data for these and other companies.

Actual impact – national market share

There is some evidence that the national market share of some EU-owned automotive manufacturers has declined and this is consistent with the expected effects of the single market programme. However, when we interviewed the firms regarding these changes in their national market share, their view was that the primary reason for the fluctuations were new model launches such as the Citroën ZX, BMW 3-Series and Renault Clio. In our view, the single market programme has been one of many facilitators of an increase in global competition which have increased the pressure on manufacturers to launch new competitive products and maintain national market share.

Expected impact – EU market share

With the removal of barriers to trade throughout the EU, EU-owned and EU-based automotive manufacturers could increase their share of the EU single market compared with 'foreign' competition from outside the EU. The reason for this is that EU automotive manufacturers will be able to utilize economies of scale through the exploitation of new markets. On the other hand, non-EU-owned manufacturers could benefit most from the implementation of the single market because it is now easier for them to implement an entry strategy for the whole of Europe. In this case the market share of the EU-owned manufacturers will fall. Both of these hypotheses – increasing or decreasing share for EU-owned automotive manufacturers – can be tested through examination of EU market shares.

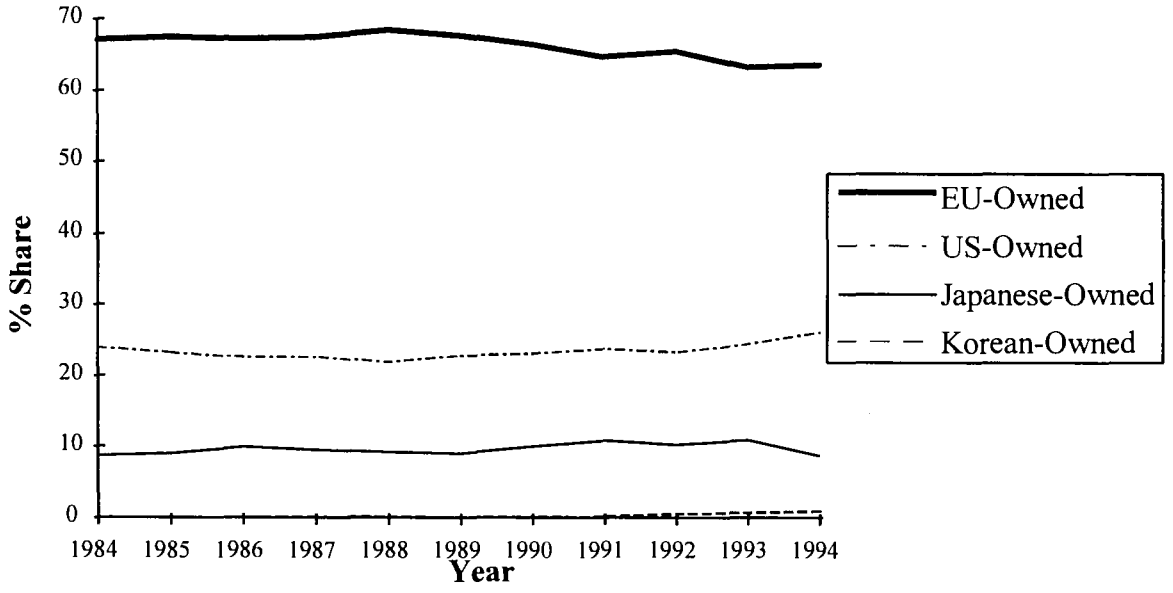
Other factors

As discussed earlier, many of the EU-owned automotive companies have been adopting a more globalized approach to production and sales as the competition in the automotive industry becomes more and more globalized. This could lead to a falling share of the EU market held by the EU-owned markets because new markets are presenting new sales opportunities.

Quantitative analysis – EU market share

Figure 5.19 shows the share of total sales in the EU of EU-owned manufacturers, US-owned manufacturers, Japanese-owned manufacturers and Korean-owned manufacturers.

Figure 5.19. Share of European passenger car market (volume), 1984–93



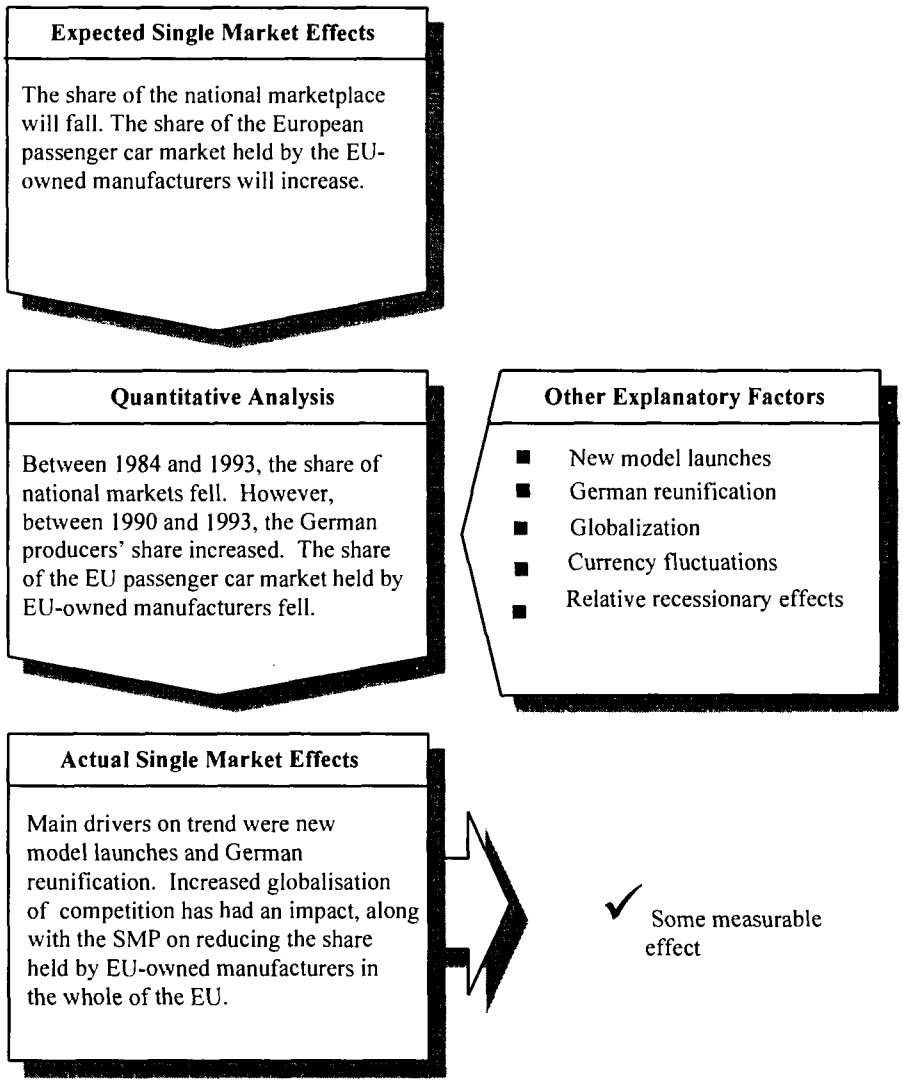
Sources: Ward's, 1994, SMMT, 1995.

The European manufacturers' share of the EU market has fallen slightly over the period shown. The fall occurred exclusively after 1988, from 69% in 1988 to 64% in 1994. Japanese-owned manufacturers' share of the European passenger car market has increased over the period from 9% to 11% and Korean manufacturers, having entered the market in 1991, already have a share of around 2%.

Actual impact – EU market share

The Korean and Japanese-owned manufacturers appear to have benefited most from the removal of national barriers. The analysis above is not consistent with the hypothesis that the single market programme would result in increased share for the EU-owned manufacturers but is consistent with the hypothesis that foreign competitors would benefit most from the single market programme. However, recent developments in the political structure have had an effect with some European manufacturers exiting the market, such as Moskovich, Trabant and Yugo. The analysis also reflects increasingly globalized competition – foreign companies are seeking sales from new markets, increasing competition for the companies already in the EU.

Figure 5.20. Summary diagram 6: Hypothesis 6



5.1.10. Conclusions

Referring back to Figure 5.1 at the beginning of this chapter, we have analysed each of the hypotheses relating to market access, starting at an aggregate level and working through the national and manufacturer analyses.

Hypothesis 1 looked at the aggregate level of intra-EU trade. At this level of analysis the single market programme does not appear to have had an effect. This is probably because some manufacturers and countries had been more affected by factors other than the single market programme.

Hypothesis 2 looked at the effect of the single market programme on intra-EU trade for individual countries. We found that the degree of intra-EU trade for a number of countries had been increasing well before the implementation of the single market programme. We would expect automotive manufacturers to act on the expected impact of the single market

programme well before it is actually implemented. Whilst general trends towards pan-European and global markets undoubtedly account for part of the effect, the single market programme appears to have reinforced this trend.

Hypothesis 3 looked at the impact of the single market programme on market share variance across the EU. Despite possible problems caused by cultural diversity and exchange rate instability, our results were consistent with expectations for the largest manufacturing countries – France and Germany – but were not conclusive in the cases of Italy and the UK.

The analysis for hypothesis 4 looked at the number of models and variants available in major European markets before and after the implementation of the single market programme. Our analysis showed that the single market programme has led to an increase in product availability and more widely dispersed product popularity.

Hypothesis 5 looked at the relationship between national and non-national sales on a company-by-company basis. The findings were mildly supportive of our hypothesis, although German reunification also played a part. The inconsistency of the results made it difficult to separate out with any degree of confidence the effects of the single market programme.

Hypothesis 6 looked at the manufacturers' share of their Member State national markets for passenger cars. This showed that the national market share of manufacturers had fallen. This is consistent with the expected impact of the single market programme. Since the concept of a 'national' market is becoming less meaningful as manufacturers locate plants throughout Europe, we looked at shares of the EU passenger car market as well. This suggested that the market had become more competitive, benefiting the more pan-European US- and Japanese-owned manufacturers over their EU-owned counterparts.

In summary, therefore, our analysis suggests that the single market programme has improved market access. In much of our analysis, other factors, in particular the business cycle, complicated and dominated our results.

5.2. Hypothesis 7: Competition and market concentration have increased

Returning once more to Figure 4.2 in Chapter 4, we have already examined the impact of the single market programme on market access and on intra-EU trade. The next level in our hierarchy of hypotheses is concerned with the impact of the single market programme on competition and concentration.

5.2.1. Expected impact – concentration ratios and the Herschman–Herfindahl Index

As competition intensifies, manufacturers may look for opportunities to acquire other companies in order to:

(a) ease access to particular product markets or geographic areas;
(b) increase total productive capacity and gain economies of scale.

As take-overs increase, market concentration will increase – fewer companies will be in the market. In addition, as the single market programme is implemented, the larger, more successful companies are likely to gain market share across the EU through the exploitation of newly-available economies of scale. This will also increase concentration. We are using two

different methods of calculating market concentration: concentration ratios and the Herschman–Herfindahl Index (HHI). Concentration ratios examine the total market share held by a certain number of firms in a market. The HHI examines the degree of fragmentation of market share for all firms in the market.[5] The HHI is often used as a measure of concentration in competition investigations because it gives a view for the whole of an industry.

Through these two measures we will be able to assess what is happening to concentration at the top end of the industry and for the industry as a whole.

5.2.2. Other factors – concentration ratios and HHIs

It is likely that, as global competition increases, levels of concentration will increase as companies seek to protect their market position through aggressive acquisition. This would be another factor which, regardless of the expected impact of the single market programme, will increase market concentration. Market conditions will also have an effect since recession may result in more take-overs as companies seek to protect themselves. It may also be argued that the single market of the EU is attractive to new entrants, such as the Koreans, because it is now easier to implement a clear entry strategy for the whole of the EU rather than having to make adjustments between Member States. The analysis also does not allow for the 'hidden' concentration, such as VAG's consolidation of the holdings in Seat and Skoda. Other factors that are equivalent to barriers to entry, such as high investment costs, could affect the level of concentration.

5.2.3. Quantitative analysis – concentration ratios and HHIs

Figure 5.21 presents the concentration ratio, the degree of market share in the hands of the top companies, for the top three, five, seven and ten automotive companies in Western Europe over the period 1989 to 1994.

There is a trend of small increases in concentration at the individual company level:

(a) The concentration ratio for the top three companies has increased. Given that no major take-overs have occurred in this period, this is an indication of the growing market strength of the top producers, probably through the exploitation of newly-available economies of scale.
(b) The concentration ratio for the top five and seven companies have remained relatively constant throughout the period.
(c) The concentration ratio for the top ten companies has also increased.

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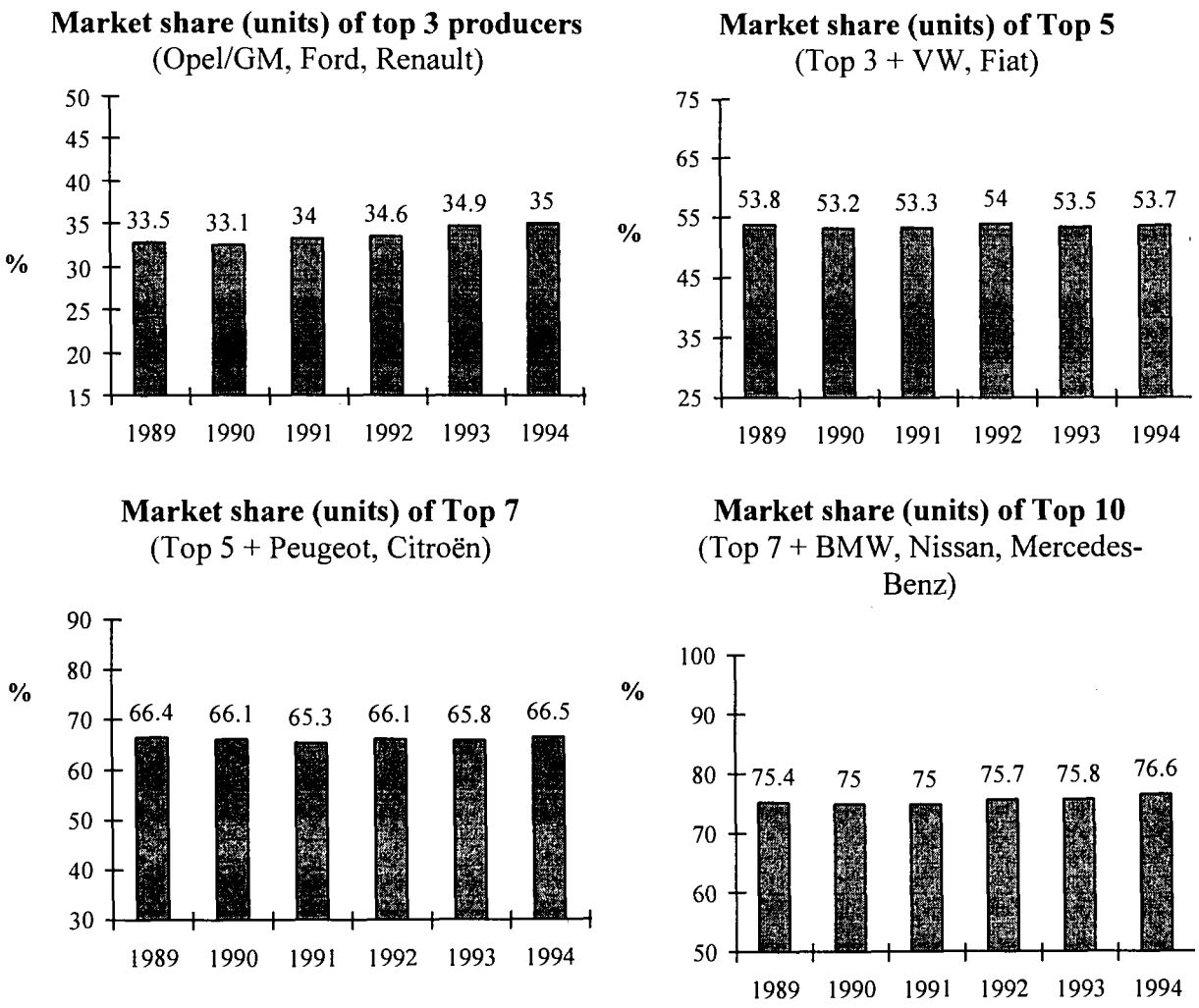
[5] The HHI is the sum of the squares of all manufacturer market shares and ranges from zero (zero concentration) to 10,000 (monopoly, i.e. 100^2). The more fragmented the industry, the more firms with low market share and the lower the HHI.

Figure 5.21. Concentration ratios for major marques, passenger cars, 1989–94



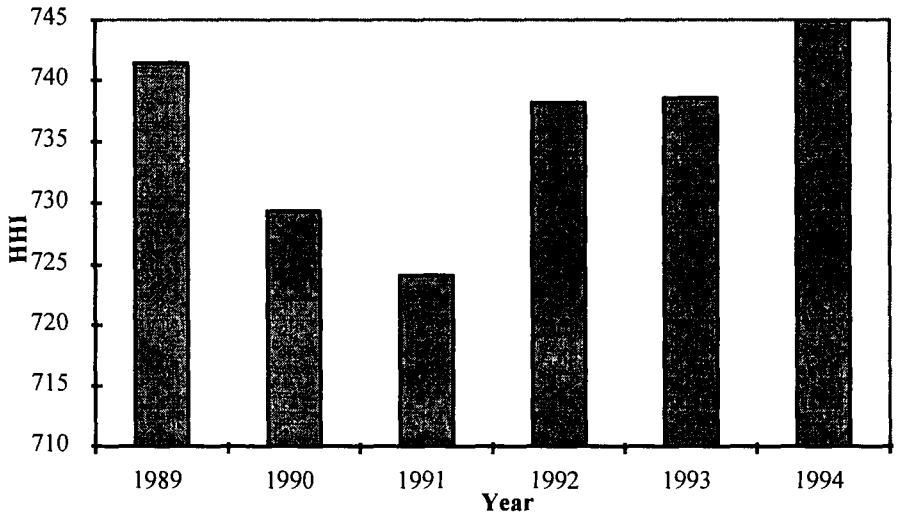
Source: Economist Intelligence Unit 1995.
Note: The names in brackets are the top producers in 1994.

One of the reasons for these results is that there has been some consolidation in the sector between the companies:

(a) Fiat has gained control of Alfa Romeo;
(b) BMW has acquired Rover;
(c) VAG has consolidated its holdings of Seat and Skoda.

Figure 5.22 shows the HHI of the EU automotive market for 1989 to 1994.

Figure 5.22. EU market concentration ratios (HHIs), 1989–94



Source: E&Y.

Contrary to expectations, the level of concentration as measured by the HHI actually fell between 1989 and 1991. The HHI then recovered by 1994 to only just more than the concentration level in 1989. There appears to be a high correlation between the degree of concentration as measured by the HHI and market conditions.

5.2.4. Actual impact – concentration ratios and HHIs

It is likely that the single market programme has facilitated the small increase in concentration as observed by the concentration ratios for the top three and top ten companies. This is consistent with our expected impact of the single market programme. However, market conditions also appear to be playing a part in our analysis. Our analysis of the whole market concentration through HHIs up to 1994 indicated that the market was becoming more fragmented but then increased to a level similar to 1989. It seems likely that increasing global competition and the recent recession are playing a more important part in determining the level of concentration than the single market programme.

5.2.5. Expected impact – profitability

Barriers to entry allow a producer to price above the level it would price at if competition allowed entry into the market. This means that profits will be higher before barriers are

removed than they will be afterwards. The removal of barriers to entry, and the increase in competition that this enables, should drive down profits. Measuring profitability, therefore, should indicate whether the competitive environment in the EU has changed.

5.2.6. Other factors – profitability

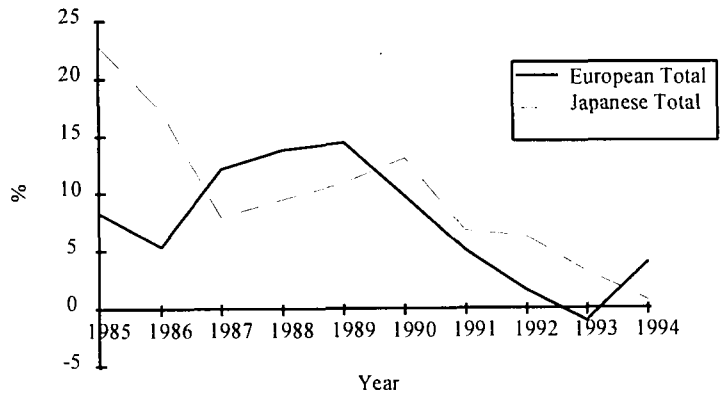
Globalization of competition is likely to have an effect on our analysis. However, profitability is not only affected by competition. In recent years, the global automotive industry has been hit hard by recession. This will reduce the level of profitability of most firms. With recession comes over-capacity, which will also reduce profitability as firms attempt to reduce stock by selling at a lower price, cutting margins. Furthermore, to avoid problems with over-capacity, EU manufacturers have succeeded in lowering their break-even points, thus providing some security against cyclical downturns in demand and thus affecting profitability. In their case study, Renault also argue that the increasing cost of compliance with new regulations means that it is harder to maintain margins. Currency instability also places companies in a difficult balancing act between the maintenance of market presence and the loss of profit.

5.2.7. Quantitative analysis – profitability

We have used return on capital employed as our measure of profitability. We have examined a number of EU-owned manufacturers' (PSA, Renault, Volvo, VAG) average return on capital employed over a ten-year period, and compared this with a sample of Japanese-owned global manufacturers' (Honda and Nissan) return on capital.

Naturally, the competitive environment is not the only influence on profitability. Market conditions and excess capacity are all factors which will have a bearing on the degree of automotive manufacturers' profitability. We present our analysis in Figure 5.23.

Figure 5.23. Return on capital employed (%), 1985–93



Source: Marketing Systems GmbH.

Figure 5.23 shows that:

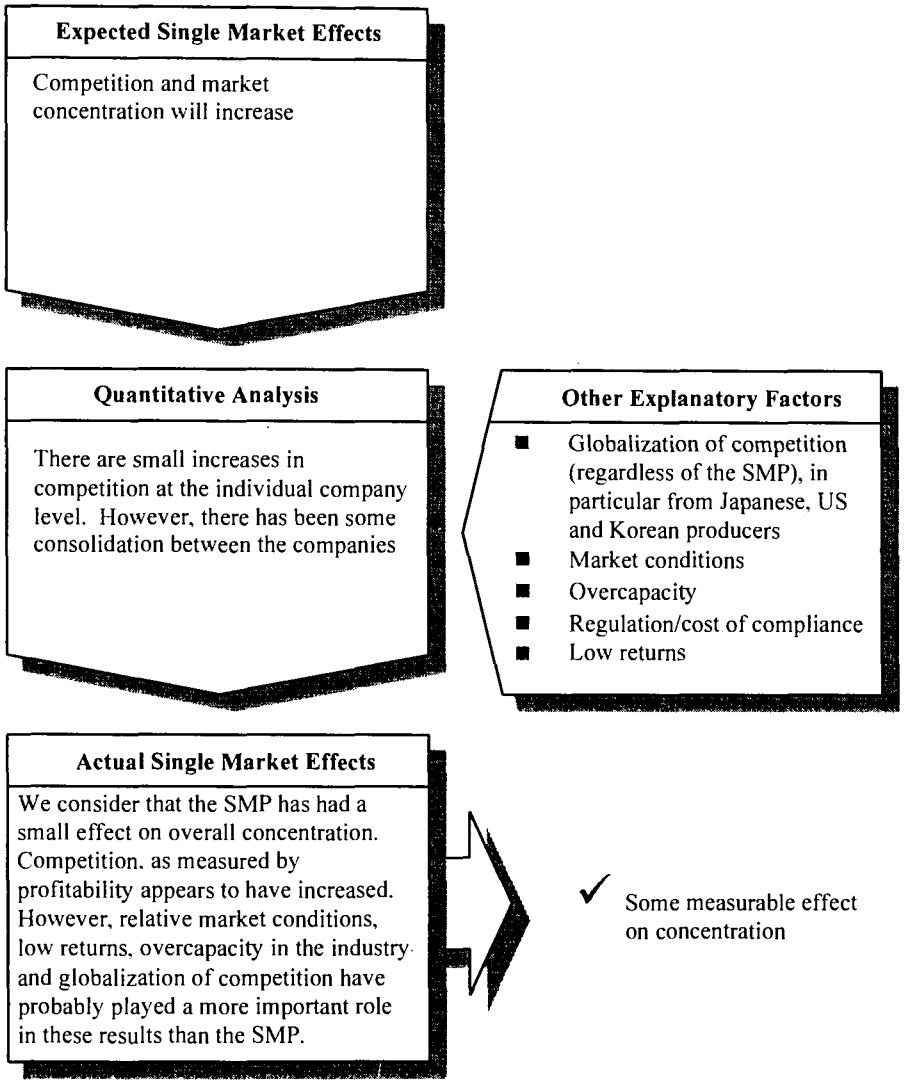
(a) For all manufacturers, return on capital employed has fallen over the ten-year period. Fluctuations experienced by the EU-owned manufacturers are closely correlated to the business cycle, as would be expected.
(b) Japanese return on capital employed is also falling during the period and is similarly correlated to the business cycle. The general trend will also have been influenced by the appreciation of the Yen.

5.2.8. Actual impact – profitability

Levels of competitiveness, as reflected by reductions in profitability, appear to be increasing. This is consistent with the expected effects of the single market programme. Undoubtedly, the business cycle will be an important explanatory variable and, at this relatively early stage in companies' development within the single market, it is difficult to determine the exact influence of the single market programme.

In our case studies, some companies argued that the increasingly competitive global automotive industry means that maintaining margins is more difficult and that the single market programme is, at most, one factor among many increasing competition. Furthermore, some companies are concerned that the additional costs of compliance with more and more stringent regulations combined with the increase in competition are increasing the downward pressure on margins. Increasing costs from compliance with regulations combined with increasing competition means that it is increasingly difficult for the manufacturers to pass on these increasing costs to the consumer, even if the product is of a superior quality. For example, side impact tests have caused the development of side impact bars, increasing the car weight which has increased purchasing and in-use costs for the consumer. Furthermore, emissions tests require exhausts to include catalytic converters which make them more costly, bulkier, heavier and more brittle. Volvo estimate that emissions regulations have added an extra ECU 1,800– 2,400 to their costs per car. Combining these increased costs with increased globalization of competition means that margins are falling. The single market programme has reinforced this trend.

Figure 5.2.4. Summary diagram 7: Hypothesis 7



5.3. Hypothesis 8: Final prices will become less variable across the Member States

5.3.1. Expected impact

Final prices should have become less variable across the Member States as a result of the single market programme. As barriers to trade are removed, distortions in information, availability and therefore price should be removed. Therefore, the variance of price of the same model across all Member States should fall as the single market programme takes effect. We are fortunate that for the past three years, the European Commission has researched and published an analysis of car prices across the EU. In compiling these data, great care has been taken to exclude taxes and to ensure that the same vehicles are compared in the survey.

Our analysis examines whether European car prices (adjusted for each model and level of trim) are equalizing across the Member States. The expectation is that the implementation of

the single market programme would tend to bring prices for the same model closer together across Member States.

5.3.2. Other factors

With any analysis of Member State prices over a period of time, exchange rate differences during the period will have an effect. Variances in prices will be affected by currency devaluations in any one Member State, because the relative price of the same vehicle in two different states will change. Despite the fact that the prices recorded by the EC are net of tax, tax differences still affect pre-tax prices. Cross-border shopping for cars is still more complicated than cross-border shopping for most other goods. Usually, the country of origin principle is employed, and therefore the full price is paid in the country where a good is bought. For cars, a different regime applies. The net price of a new car is paid in the country of purchase, and VAT and other purchase-related taxes have to be paid in the country where the car is finally registered, impeding consumers to make full use of the single market in this sector. In Denmark, for example, there is close to a 100% purchase tax which places a downward pressure on the pre-tax prices set by manufacturers in order to retain sales in Denmark. A lower pre-tax price in Denmark means that pre-tax prices across the whole of the EU are also forced down so that manufacturers can retain an EU-wide pricing policy minimizing tendencies towards cross-border shopping.

5.3.3. Quantitative analysis

We have calculated the average price for all vehicles in each of the EU Member States for the five time periods. With these average prices we have then calculated the variance across the Member States. Because of the anticipated problems with exchange rate fluctuations, we have also split the price information into two groups of Member States ('loosely linked' and 'closely linked' currencies) and calculated the variance for these separately. The loosely linked currency Member States are Spain, Italy, Ireland, Portugal and the UK. The closely linked currencies are Germany, France and the Benelux states. Denmark and Greece are not included in the analysis because the data were not available for these Member States for the entire period. The results of these analyses are presented in Table 5.11.

Table 5.11. The evolution of car price differences in the EU, May 1993 to November 1995[1]

Date	Total variance	'Loosely linked'	'Closely linked'
May-93	18.00	9.73	5.89
Nov-93	26.68	1.61	11.67
May-94	20.87	1.80	3.93
Nov-94	21.83	13.41	4.95
May-95	46.36	26.87	6.00
Nov-95	21.74	0.007	5.73

Source: Car Price Differentials within the EU.
[1] The calculation of variance is based on indices where 100 represents the price in Belgium.

Table 5.11 shows that:

(a) The variance of car prices across all Member States has actually fluctuated but is fairly static with a variance of around 20.
(b) Unsurprisingly, the variance of car prices for the 'loosely linked' Member States has fluctuated quite a lot and no clear trend can be seen. However, the variance in the last time period was effectively zero although too much weight should not be given to one data point.
(c) The closely linked variance is generally lower than the loosely linked variance and, apart from a jump in November 1993, appears to be gradually falling.

We have carried out an additional analysis of the variance of car prices for a selection of Europe's most popular cars:

(a) Ford Fiesta
(b) Ford Escort
(c) VW Golf
(d) GM Astra
(e) GM Corsa
(f) Peugeot 306
(g) Peugeot 106
(h) Renault Clio
(i) BMW 3-Series
(j) Fiat Cinquecento
(k) Fiat Punto.

This selection was made on the basis of the most popular models in 1994 as shown in Tables 5.3 to 5.10, our analysis of the most popular models in Belgium, Germany, Spain, France, Italy, Portugal, Sweden and the UK. Because of exchange rate fluctuations, we have once more carried out separate analyses of variance of these cars: all models in the Member States with 'loosely linked' currencies and all models in the Member States with 'closely linked' currencies. The results of these analyses are shown in Table 5.12.

Table 5.12. The evolution of car price differences in the EU, May 1993 to November 1995, selected models[1]

Date	Total variance	'Loosely linked'	'Closely linked'
May-93	34.60	24.06	10.52
Nov-93	49.51	42.33	21.88
May-94	36.51	33.68	9.91
Nov-94	40.77	43.73	4.18
May-95	54.47	47.01	10.56
Nov-95	26.23	14.41	5.25

Source: Car Price Differentials within the EU.
[1] The calculation of variance is based on indices where 100 represents the price in Belgium.

Table 5.12 shows that:

(a) Over the period analysed, the total variance in prices for the most popular models has fluctuated a lot.
(b) The total variance for the most popular models is consistently much higher than the variance for all models as shown in Table 5.11.
(c) Examination of loosely linked variances shows that one of the reasons for the differences between Table 5.11 and Table 5.12 is that the variance in price for the most popular models in the 'loosely linked' Member States is very high.
(d) Despite this, the variance in prices for the most popular models in the 'closely linked' Member States is consistently higher than the corresponding figures in Table 5.11. It could be said that these figures are trending down although the time series is short.

5.3.4. Actual impact

Price as a measure reflects a whole range of causal factors and as such is a relatively unsatisfactory means of getting to a single issue. Probably partly as a result of this, the results of our analysis are somewhat ambiguous. This may be because of a lack of data, or that even splitting into separate groups of Member States is not enough to remove the impact of exchange rate fluctuations. The variance is generally less for 'closely linked' currencies, suggesting that exchange rate fluctuations are important; there is greater variance for the most popular cars; and the trend is downward for the most popular cars in the closely linked currencies.

It is unlikely that the automotive industry treat their pricing policy in the same way. Certainly, Renault described a situation where they had to balance the twin concerns of maintaining market share in other Member States and profitability. One factor confusing this balance was the desire of the company to maintain a relatively clear pricing structure across Europe. The purpose of this policy was mainly to help the dealers near the borders with Member States whose currency had recently devalued and avoid the possibility of parallel exports.

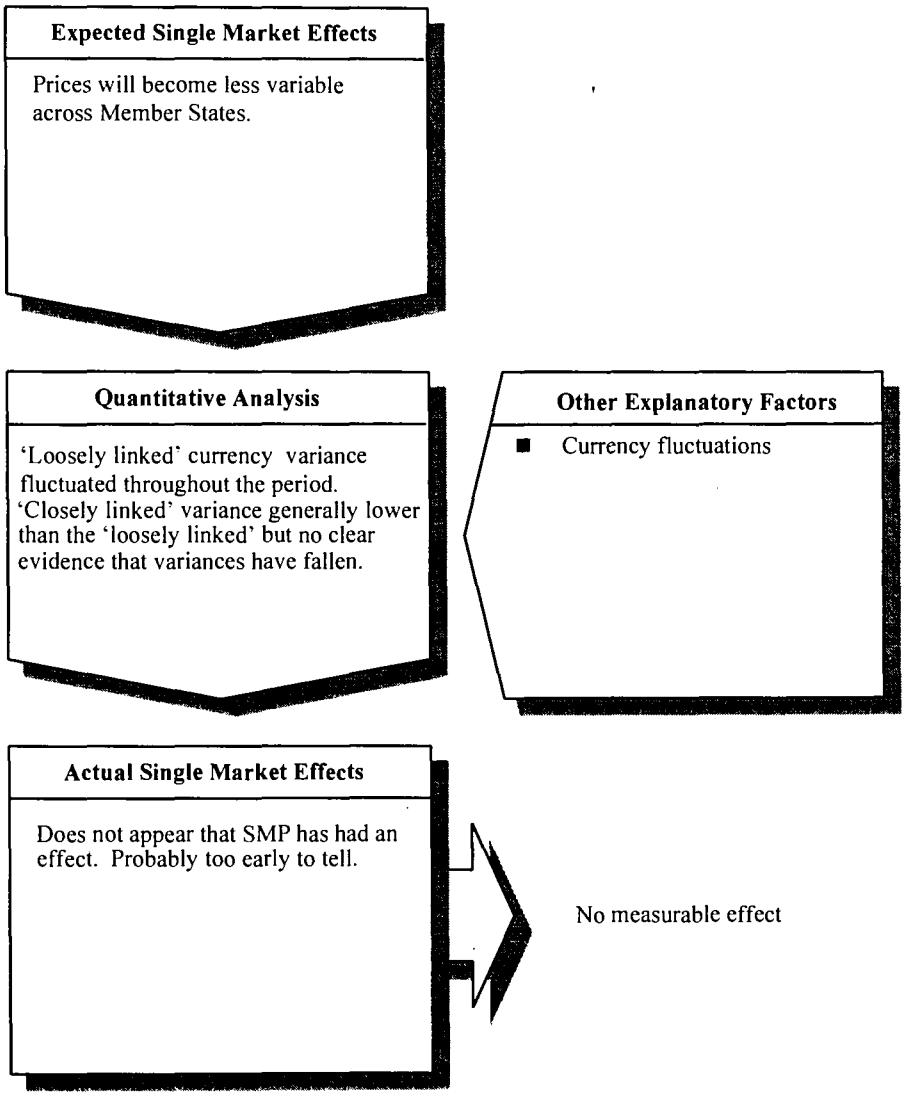
Nissan explained how their pricing strategy had been affected by the devaluation of the Lira. Traditionally, Nissan develop their pricing strategies through negotiations with the country distributors, and by comparing their European prices against competitor car prices. However, following the devaluation of the Lira, Nissan were unable to continue with this pricing strategy since their distributors in southern Germany, Austria and France would be placed in serious financial difficulty as customers undertake parallel importing from Italy. To avoid this problem, Nissan have changed their prices in Italy, reducing the possibility of growth in this Member State.

The Italian producer, Fiat, suggested that the devaluation of the Lira has had only a limited effect, helping Fiat to improve profitability. Fiat have also used the devaluation to offer more 'added extras' on their cars so that they are more competitive. Our analysis in Section 5.1.3 found that there has been a strong correlation between the performance of Italian producers in their national market and the ECU/Lira exchange rate.

Another pricing change has been occurring over recent years which may be affecting the results of this analysis. A redefining of the prices for the different product segments has started. For example, the introduction of the new Mercedes A-class, a small car, came with a large car price tag. This move is an attempt to get away from following the price/segment

strategy of the market leader in each of the segments. This strategy is intended to allow producers to establish their brands without having to follow other manufacturers' pricing strategy and hence gain market share within the newly defined 'market'.

Figure 5.25. Summary diagram 8: Hypothesis 8



5.4. Hypothesis 9: Pan-European marketing and distribution networks have developed

The next hypothesis is that pan-European marketing by automotive manufacturers has developed in response to the single market programme.

5.4.1. Expected impact

As market access increases, we would expect to see the development of structures for pan-European marketing and distribution networks as companies proactively undertake to sell more output in other Member States. There should be less distinction between national networks as a pan-European manufacturer viewpoint takes hold. Economies of scale in marketing and distribution will be more readily available as the single market programme becomes established, presenting manufacturers with new opportunities to reduce costs.

5.4.2. Other factors

The development of pan-European marketing and distribution is likely to be affected by a number of different factors. A likely barrier to pan-European marketing is the cultural difference between Member States – what appeals to some countries does not appeal to others. Existing contracts with distribution companies are likely to be relatively long-term and developed over a number of years. This ensures that the manufacturers have a guaranteed supply, with distributors they know and trust, but will slow down adjustments to external change. The third factor which may affect the development of pan-European distribution networks is the block exemption for the automotive industry from Article 85 of the Treaty of Rome, allowing certain restrictive agreements between vehicle manufacturers and distributors. We describe the block exemption in detail in Section 3.1.2. A final factor for consideration is that the market for automotive vehicles in the EU is not homogeneous. Long-running structural differences in demand and distribution mean that setting up a retail network across the EU might be of limited benefit.

5.4.3. Quantitative analysis

Our case studies revealed different strategies among the automotive manufacturers. Renault said that they never used pan-European advertising campaigns because of the cultural differences amongst the Member States. Volvo has a different strategy of focusing different advertising strategies on different areas of Europe based on the fact that their products appeal only to some Member States and they appeal in a different way to each of these areas. Volvo is essentially dependent on three main countries for its sales: Sweden, the UK and Germany. Nissan, on the other hand, usually launch new models using a pan-European marketing campaign, often with a common advertising theme. For example, the Almera advertising campaign was shown in France, Germany, the Netherlands, Spain and the UK. However, smaller campaigns are organized by national distributors, usually with the national operation of the same advertising company. Fiat also prefers to target the European customer, but they also acknowledge the importance of more 'local' advertising campaigns. Peugeot carried out separate advertising campaigns in Germany, France and the UK in launching its new 406 model.

Distribution is dominated by small, independent enterprises. The four major markets are served by some 70,000 dealers. Some characteristics of European dealerships are shown in Tables 5.13 to 5.15.

Table 5.13. Retail car outlets in European markets, 1994

Country	Main dealers	Sub-dealers	Total
Germany	17,000	9,000	26,000
France	4,000	19,000	23,000
Italy	4,500	10,250	14,750
UK	6,700	600	7,300

Source: Neil Mullineux, 'Car Retailing in Europe', *Financial Times Management Report*, 1995.

Table 5.14. Average dealership in Europe, 1994

Business area	Units
New car sales (units)	500
Used car sales (units)	400
Turnover (million ECU)	6
Employment (number)	34
Workshop staff	15
Commercial/administration	19
Facilities (sq metres)	8,000
Start-up costs (million ECU)	3

Source: EIU, 'The Future of Car Retailing in Western Europe', 1995.

Table 5.15. Comparison of US and European dealers, 1994

	US	Europe
Population (million)	260	470
New car sales (billion ECU)	107	165
Car parc (million)	130	155
Franchised dealers (thousands)	23	100
Sales per dealer (million ECU)	4.6	1.7
Cars per dealer (number)	1,800*	500*

Source: Mullineux, 1995.
*E&Y estimates.

The size and structure of distribution systems employed by vehicle assemblers varies according to the national market served, and the strategy of the assembler concerned. That is, in detail at least, there is little evidence for cohesive and uniform distribution systems in Europe.

We can identify three types of distribution structure in Europe according to a range of characteristics, as shown in Table 5.16.

Table 5.16. Typology of distribution systems in Europe

Type	Southern Europe	Northern Europe	UK
Owned sales points	Many, especially Fiat, Renault, PSA	Mixed, mainly Mercedes, Volvo	Few
Sales per point	Low, under 100 per annum	Medium	High, over 300 per annum
Second tier	Many, some rationalization	Mixed, several types of second tier	Few, being phased out
Multifranchising	Weak, usually only within major groups	Very weak	Extensive, over 35% of all outlets
Dealer groups	Few with more than five sites	Some larger 'regional' groups with 20+ sites	Large, some with national coverage
Japanese networks	Very weak	Toyota and Nissan have good networks, others much weaker	Well established

Source: CAIR.

(*Note:* Southern = Italy, Spain and France plus smaller markets such as Greece; Northern = Germany, Benelux plus smaller markets such as Sweden. UK is unique.)

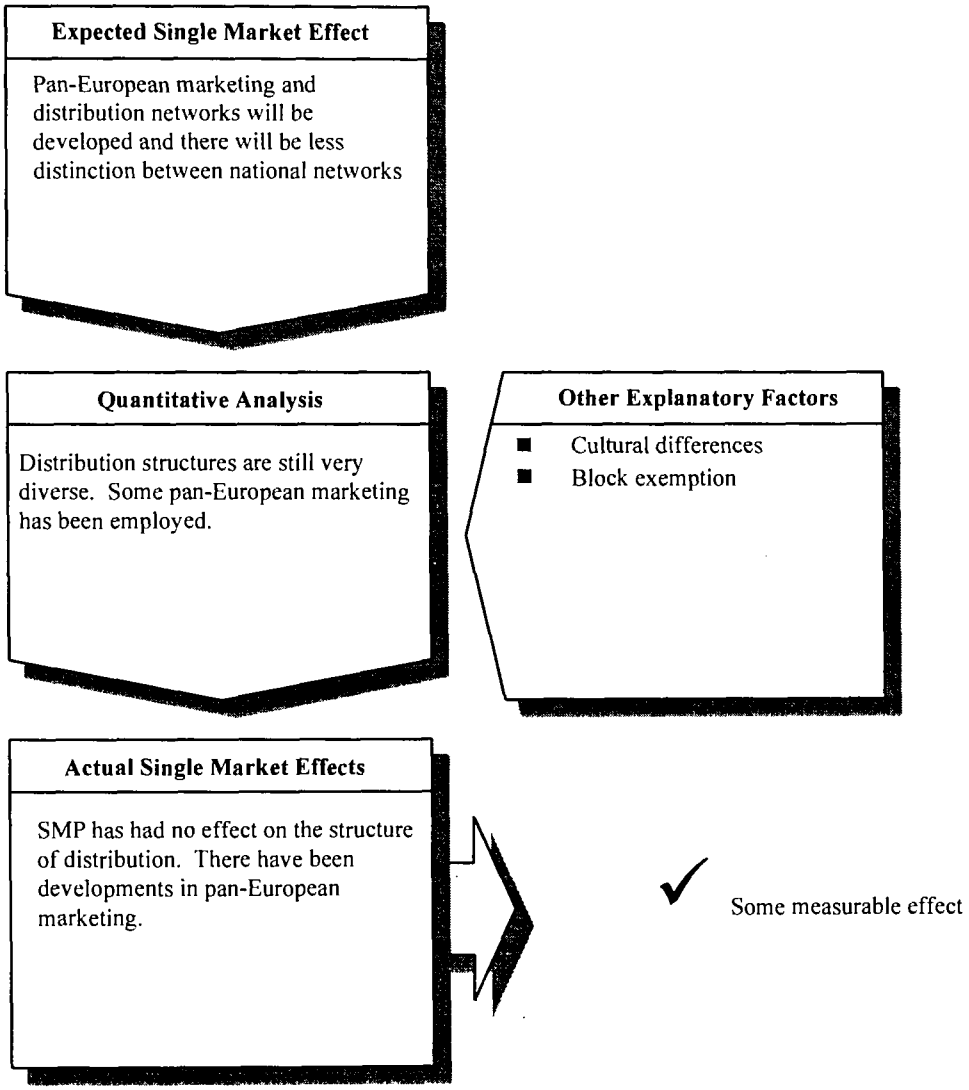
The diversity of structures and the nature of change in these structures should not come as a surprise, reflecting as they do the huge diversity in the EU. A number of factors have led to this fragmented distribution structure, of which the block exemption may be one.

Our case studies revealed a key difference between the development of distribution networks for passenger cars and commercial vehicles. Generally, commercial vehicle manufacturers need to have a far closer contact with the final consumer than is the case with cars, in order to ensure that the differing needs for a diversity of applications may be met. In Volvo's opinion, an important by-product of the single market programme is the emergence of pan-European freight companies which have significant purchasing power. Fiat-Iveco also consider that transport liberalization has significantly impacted the EU commercial vehicle industry. The deregulation of the transport sector and the elimination of customs controls have enabled more efficient use of companies' pools and have favoured concentration in the sector.

5.4.4. Actual impact

As the analysis above shows, there remain large differences in the structure of marketing and distribution around the EU. The nature of the block exemption may have been a factor in this by restricting competition, but we have not carried out any analysis to assess this, since it is outside the scope of the study. However, the structure of distribution in the EU has been affected by the single market programme through the adoption by dealers of pan-European training, quality and standards. One example of this is the FORCE programme, encouraging pan-European national vocational qualifications to improve worker mobility across Europe. Despite this, it is unclear whether economies of scale in retailing of passenger cars are attainable. The EU is an extremely diverse area with many cultural differences affecting the demand for motor vehicles. This has resulted in large distributors, such as Lex, questioning the benefits of expanding throughout Europe and actually reducing the number of dealerships they have throughout the EU.

Figure 5.26. Summary diagram 9: Hypothesis 9

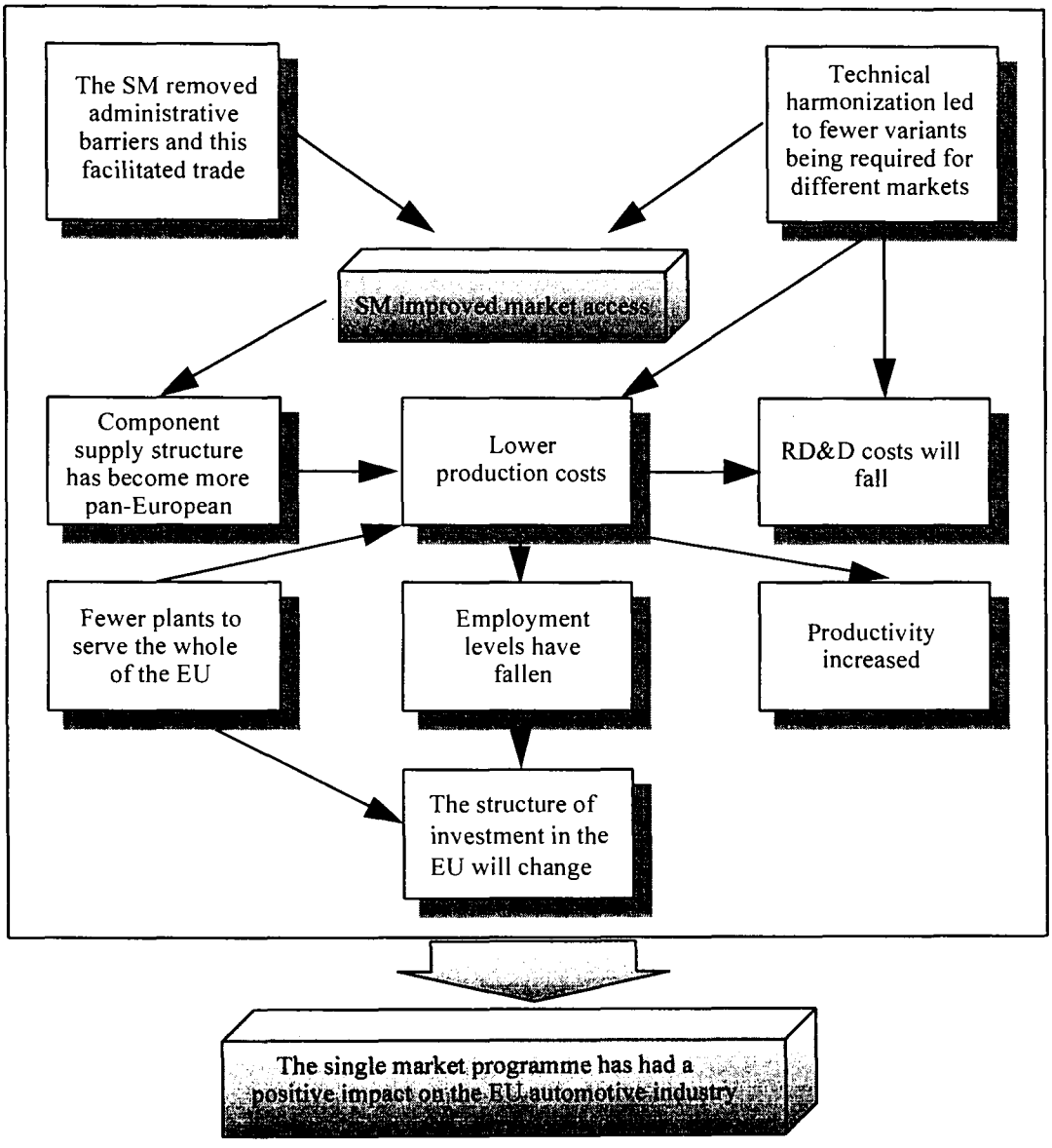


This completes our analysis of the nine hypotheses relating to the marketing process within our Industry Process Model. We drew intermediate conclusions on market access in Section 5.1.10. Our conclusions on the marketing process as a whole, along with the other processes within our process model, are presented in Chapter 8.

6. Production, purchasing and RD&D

Chapter 4 set out the methodological approach undertaken to carry out this study. This chapter examines the hypotheses directly relating to production, purchasing and RD&D. Figure 6.1 below extracts the hypotheses related to these business functions from the full set presented in Section 4.2 and Figure 4.2.

Figure 6.1. Production, purchasing and RD&D hypotheses



Sections 6.1 to 6.4 address our production hypotheses, Section 6.5 concerns the purchasing hypothesis and Section 6.6 examines the RD&D hypothesis. Our analysis of these hypotheses, along with those examined in Chapter 5, will enable us to draw as clear a picture as possible on the impact of the single market on the EU automotive industry.

6.1. Hypothesis 10: Production costs will fall

Understandably, automotive manufacturers are highly secretive about production costs as this information is commercially highly sensitive. We are unable to publish or present analyses on in-house cost data within this report. For these reasons, we have examined a number of published measures which can act as proxies for costs of production. We have also included qualitative analyses based on views expressed in our case studies. Inevitably, however, analysis based on proxies and qualitative data will always be a 'second best'. Moreover, comparison of published figures from annual accounts is always difficult due to different national practices, especially in accounting and taxation. However, we have used sources which seek to adjust for these as much as possible.

The single market programme should have decreased the production costs of vehicles throughout Europe, through savings arising from the harmonization of technical standards, savings in transport costs, greater economies in scale of production, and cheaper supplies from a more efficient components supply industry.

Figure 6.2 shows the separate measures we have used as proxies for production costs.

The first measure used is cost of sales. This includes all the costs of operating the business, including production costs. It is therefore a very broad measure. The next proxy we have used is value added. This measure strips out the cost of bought-in supplies, but includes all of the other costs associated with the business. The final proxy used is labour costs, which are a function of the wage rate and the levels of employment.

We cover the effects of the changes in components supply structure in Section 6.6.

6.1.1. Expected impact

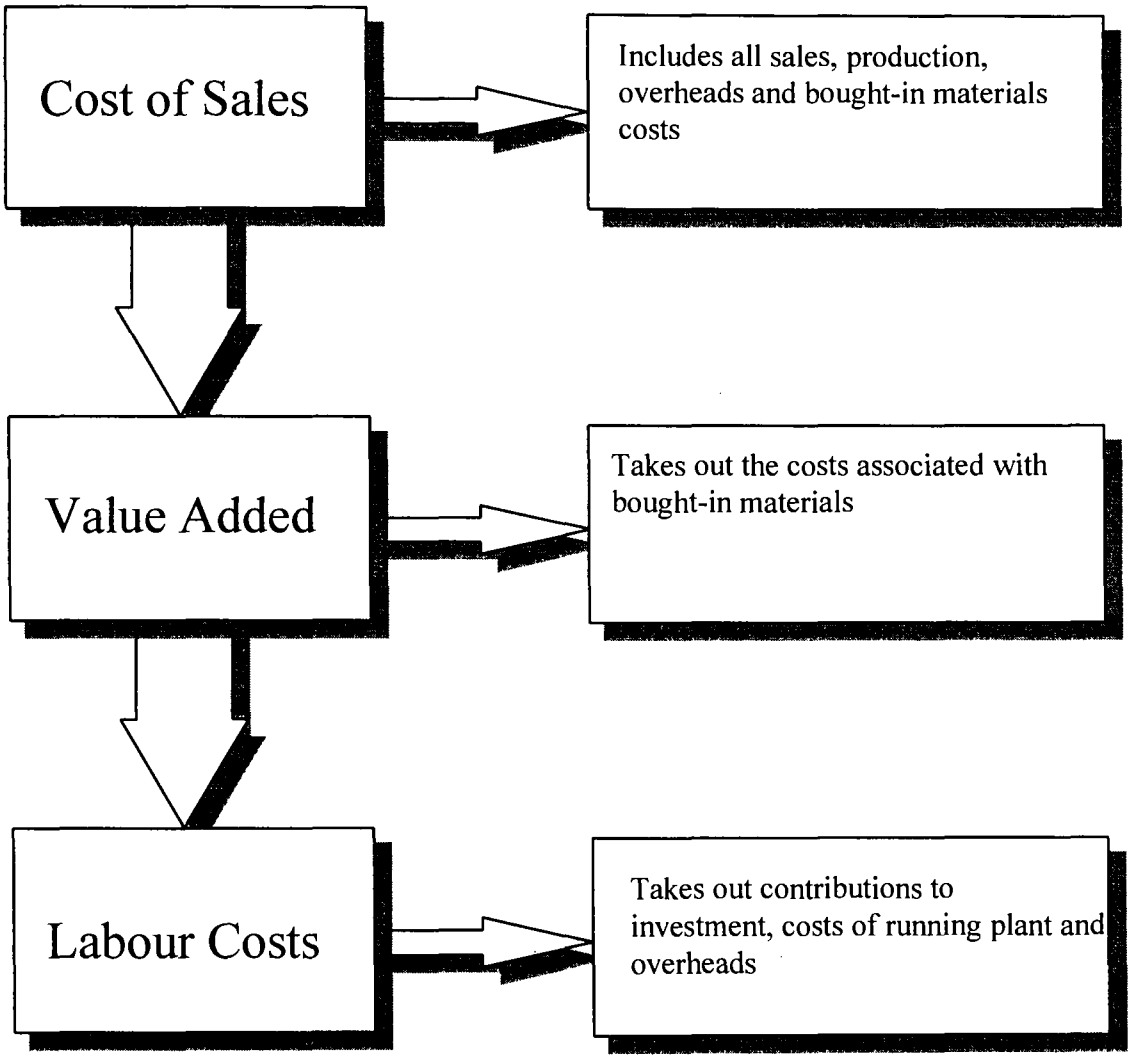
As the single market programme is implemented, we expect that there will be a more competitive environment faced by the automotive manufacturers. Manufacturers will respond to this by trying to reduce costs. The measures used as proxies for production costs should therefore show a declining trend.

6.1.2. Other factors

In attributing changes in the costs of production to the effects of the single market programme, there are other explanatory factors which could contribute to the observed results. In describing them below, we have drawn on our overall analysis of the other factors likely to affect the sector which we described in some detail in Section 4.1. The factors are as follows:

(a) External market conditions will influence the drive to reduce production costs. When there is a drop in demand, manufacturers compete over a smaller market, and put greater efforts into driving down costs and prices to the final consumer.

Figure 6.2. Different measures used as proxies for production costs



(b) Production costs will be affected by changes in the production process itself. For example, most of the industry has sought to adapt Japanese lean production techniques. The industry has also been introducing automated techniques over time, such as integrated transfer presses and water-based paint systems. Production improvements also are made on an intermittent basis, and therefore production cost changes may be 'lumpy'. Implementation of new techniques and machinery is normally carried out on new product launches (or major upgrades), when production lines require complete overhauls.

(c) New model launches will also affect production costs. Clearly, more complex vehicles with more complex platforms and features will cost more to produce.

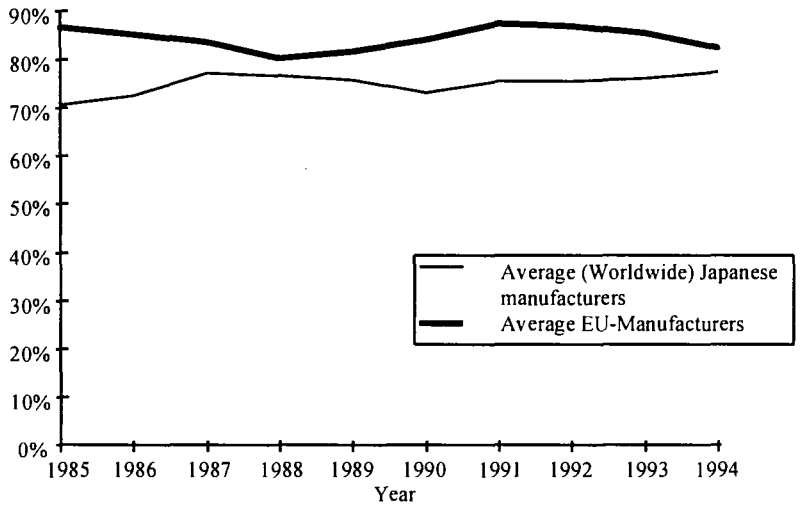
(d) Supply chain changes will also affect the results. If more components are outsourced, then this will affect the direct production costs faced by vehicle manufacturers.

6.1.3. Quantitative analysis – cost of sales as a percentage of turnover

We have collected data on the cost of sales for EU-based and Japanese manufacturers and related this to turnover.

Figure 6.3 shows the average cost of sales per unit as a percentage of turnover for a sample of EU-based manufacturers (Renault, Volvo, VW, Fiat and Ford UK) compared with a sample of Japanese manufacturers (Honda and Nissan). The decision for this sample was made on the basis of data availability. Inflation is accounted for in the analysis by creating a ratio of two variables which will have been affected similarly by inflation.

Figure 6.3. Average cost of sales as a percentage of turnover, EU-based and Japanese manufacturers, 1985–93



Source: Marketing Systems GmbH.

The figure shows that:

(a) The average cost of sales as a percentage of turnover for the EU-based manufacturers has declined gently, especially from 1991, falling by around 7% between 1991 and 1994.
(b) Although at no point are the Japanese cost ratios higher than the EU-based levels, the Japanese average cost of sales as a percentage of turnover is increasing slightly. A large part of this effect will be due to appreciation of the Yen.

6.1.4. Actual impact – cost of sales as a percentage of turnover

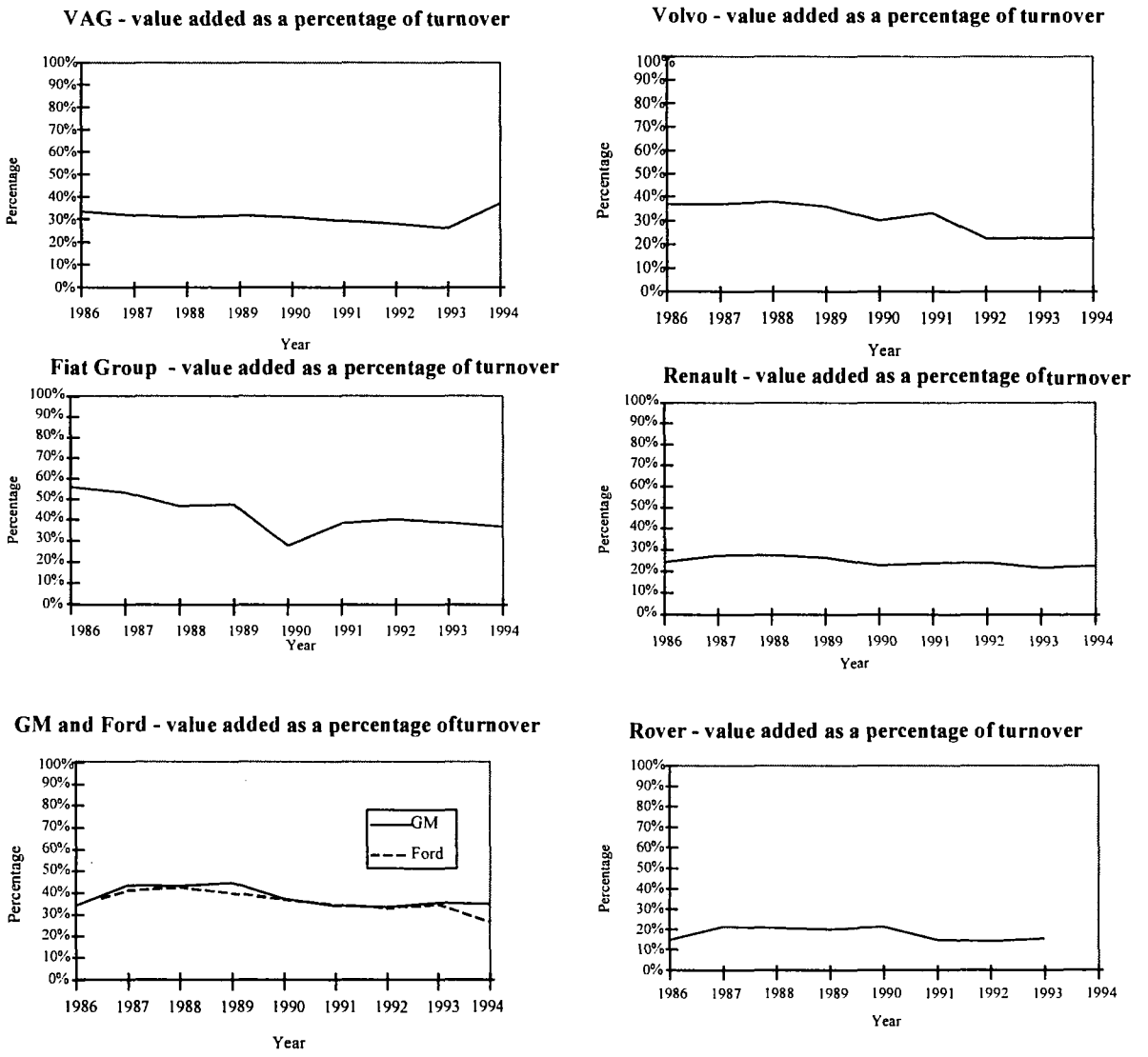
Cost of sales as a proportion of turnover is essentially a measure of profitability. It appears that there is some convergence between Japanese and EU-owned profitability and that the EU-owned manufacturers are becoming more competitive. This is consistent with the effects we expect from the single market programme. However, this analysis is at a high level and undoubtedly the other factors we identified (market demand, appreciation of the Yen) are having a substantial effect. Moreover, our case studies revealed that the EU automotive companies do not regard the single market programme as being a major factor in affecting

production costs. Most reductions in production costs are attributed to the increase in global competition, regardless of the single market implementation. At best, the single market programme is regarded as one factor among many which has contributed to increasing competition and therefore the drive to lower costs and therefore prices. Some manufacturers have argued that the increasing regulation of the industry through emissions controls and safety regulations has actually increased production costs.

6.1.5. Quantitative analysis – value added to turnover

This subsection covers value added to turnover as a proxy for production costs. This figure includes all of the costs associated with production, marketing and RD&D, but excludes the cost of bought-in supplies. If the value added to turnover is declining, production costs may be falling. Conversely, if the value added to turnover is increasing, production costs may be increasing. However, the degree of outsourcing will clearly affect our statistics. If suppliers make more of the final vehicle, the cost of bought-in supplies will increase and the value added to turnover figure will decrease. Figure 6.4 shows the value added as a percentage of turnover for a number of manufacturers between 1986 and 1993. The manufacturers chosen should provide a good idea of the effect of the single market programme. In addition, we have included figures for the two major US manufacturers to provide a comparison for the EU automotive manufacturers on a more global level.

Figure 6.4. Value added to turnover, selected manufacturers, 1986–93



Sources: Marketing Systems GmbH, Eurostat.

Figure 6.4 shows that:

(a) the general trend of the value added to turnover is declining for all of the EU-owned manufacturers;
(b) this decline is most marked from 1990 onwards;
(c) VAG experienced a decline in value added to turnover up until 1994 when there was a sudden jump;
(d) US manufacturers Ford and GM have experienced similar falls in the value added to turnover but the ratio appears to have increased slightly from 1992;
(e) there does not appear to have been any change in value added to turnover during the period shown at Renault.

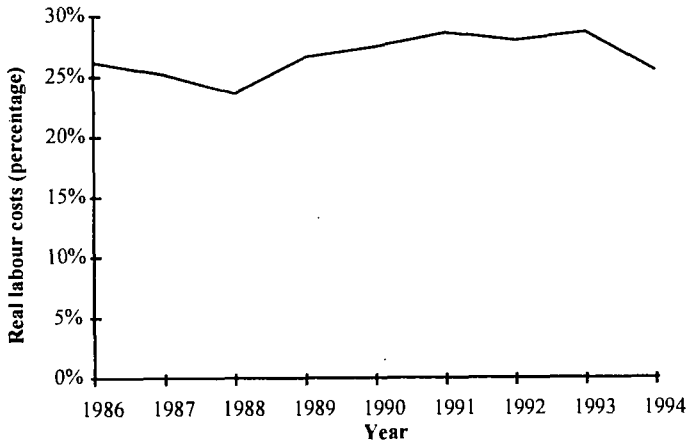
6.1.6. Actual impact – value added to turnover

Our discussions with companies as part of our case study programme led us to believe that market conditions have had a pronounced effect on the decline in value added to turnover. During the recession, companies were unable to adjust their costs to take account of the fall in sales. This is because of the high fixed costs in the industry, and the difficulties involved in laying off workers. The increase in outsourcing has also affected the results. As more value is passed down the supply chain, the cost of bought-in supplies increases, and the value added to turnover figure decreases. For example, Renault explained that 70% of the cost of the vehicle is now produced by components suppliers, compared to 20% of the cost of the vehicle some 20 years ago.

6.1.7. Quantitative analysis – labour costs

As another cost of production is labour, we have included this in our assessment of the effects of the single market programme on production costs. Figure 6.5 illustrates real labour costs as a percentage of real turnover for a number of EU and EU-based manufacturers for the years 1985 to 1993. Manufacturers included in this analysis were VAG, Seat, PSA, Renault, Fiat, Mercedes, Volvo and Ford UK.

Figure 6.5. Average real labour costs as a percentage of turnover, 1986–93



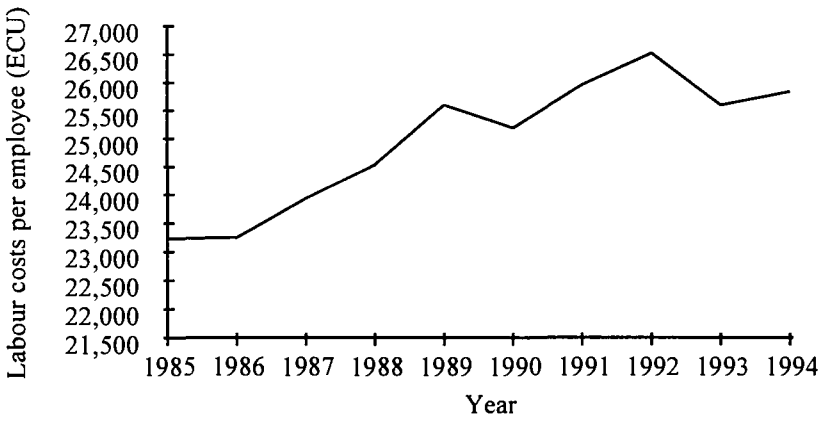
Source: Marketing Systems GmbH.

Figure 6.5 shows that:

(a) the overall trend for the growth period during the second half of the 1980s is upwards, followed by a fall in the 1990s;
(b) this decline is illustrating an increase in capital (as opposed to labour) intensity, possibly caused by more efficient working practices brought about by an increase in competition during the decline in market conditions at this time.

Figure 6.6 shows the average of the EU manufacturers' labour costs per employee. The manufacturers used for this analysis were the same as in Figure 6.5.

Figure 6.6. Average of EU manufacturers' real labour costs per employee, 1985–93



Source: Marketing Systems GmbH.

The figure shows that:

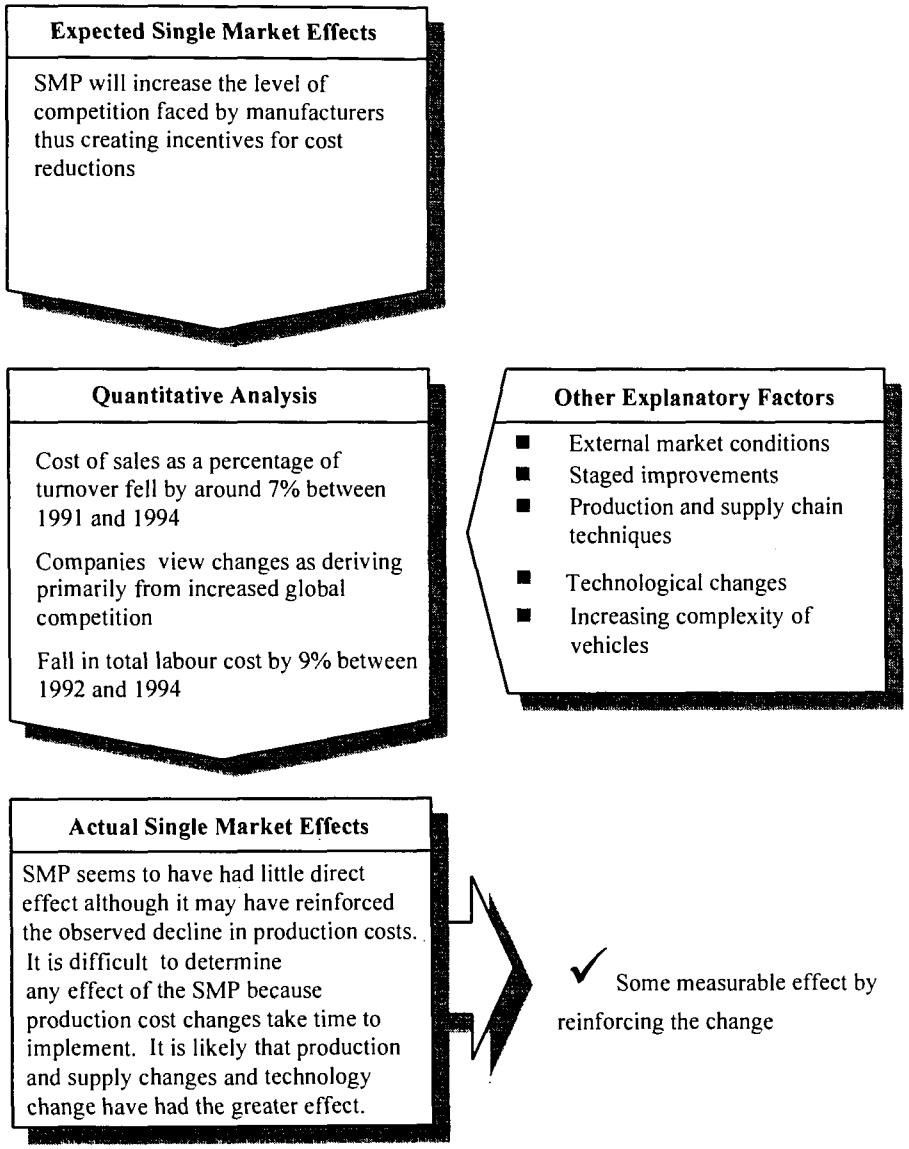
(a) the labour costs per employee have steadily increased in real terms over the entire period;
(b) average real labour costs per employee fell between 1992 and 1993 and around this period, the trend appears to have changed.

The two charts, Figures 6.5 and 6.6, show that although costs per employee are increasing fairly rapidly, the average labour cost is relatively flat over the period, suggesting that staff numbers have fallen.

6.1.8. Actual impact – labour costs

Our analysis of labour costs is generally consistent with the effects expected from the single market programme. However, our case study interviews suggested that the main factors affecting these results were changes in production methods and the downturn in market conditions. The companies did not consider that the single market programme had a significant effect on the results.

Figure 6.7. Summary diagram 10: Hypothesis 10



6.2. Hypothesis 11: Productivity has increased

6.2.1. Expected impact

A key objective of the single market programme was to increase the global competitiveness of the European industry. Whilst there are no specific single market measures aimed at increasing productivity, the increase in competition (caused by the single market) will increase the need for manufacturers to cut costs and hence increase productivity. The analysis which follows examines this issue. Again, we have used a number of different measures to gain as full an indication of the single market programme impact as possible.

6.2.2. Other factors

The other factors affecting our analysis are likely to be the same as those affecting production costs (see Section 6.1).

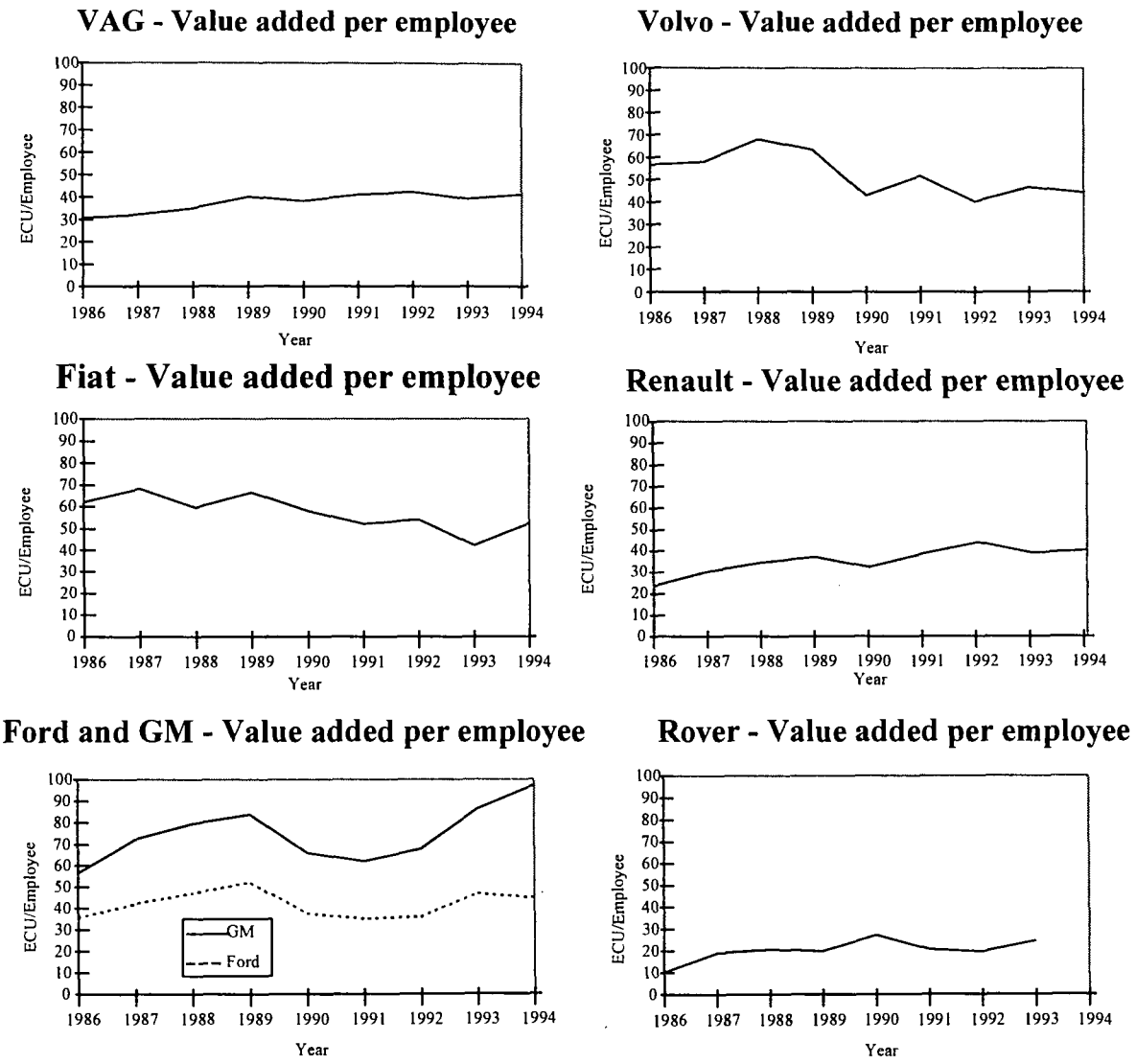
6.2.3. Quantitative analysis

Measurement of productivity in the automotive industry is recognized as particularly difficult because the types of vehicle produced do not remain constant. Whilst we recognize this fact, we have produced a range of different measures of productivity as follows:

(a) value added per employee;
(b) hours needed to assemble a standard car;
(c) numbers of cars produced per employee;
(d) units sold per employee;
(e) revenue per employee.

Figure 6.8 shows the value added per employee for a selection of manufacturers in the EU and the US from 1986 to 1993. The sample of manufacturers chosen should provide a good indication of the single market effect since they not only cover a number of different Member States, they also compare performance with US companies GM and Ford as well as provide a mixture of specialist and volume producers.

Figure 6.8. Value added per employee, ECU, 1986–93[1]



Source: Marketing Systems, GmbH.
[1] Rover data not available for 1993.

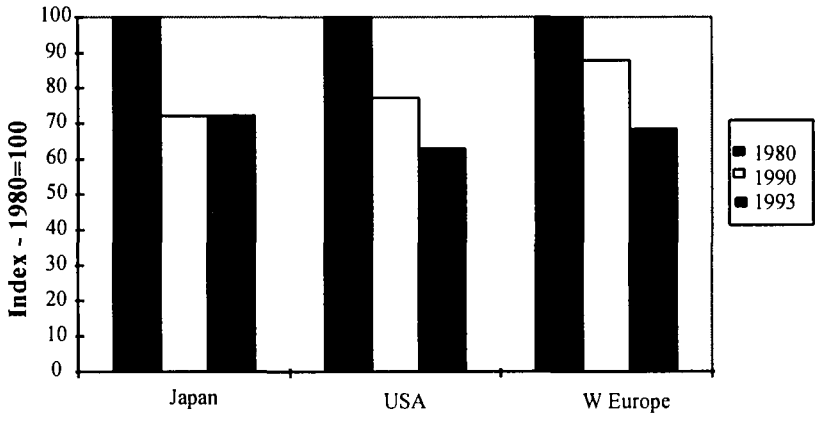
Figure 6.8 shows that:

(a) in most cases, the value added per employee has increased. Notable exceptions to this are Fiat and Volvo, although they both appear to be recovering;
(b) comparing the levels of value added per employee of US firms against EU-owned firms reveals there is still some way to go for the EU-owned manufacturers before they catch up with their competitors.

We questioned companies about the changes in productivity as part of our case study programme. Following these discussions, we concluded that the adoption of new production techniques from the Japanese and the increasing globalization of competition were the chief factors in any productivity gains.

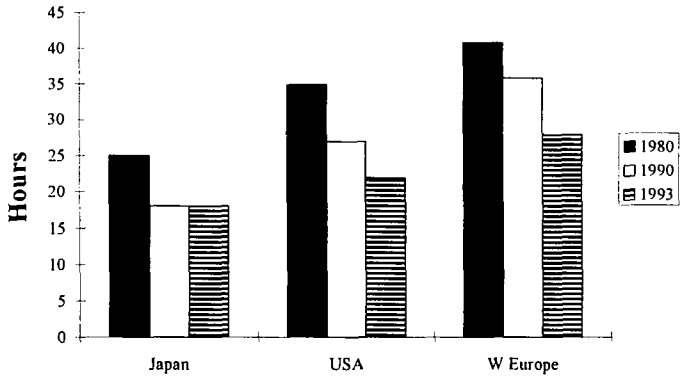
The work carried out in the early 1990s by the International Motor Vehicle Programme (IMVP) showed that there were large differences in productivity between US-based, European-based and Japanese-based manufacturers. The IMVP argued that these differences were a result of lean production techniques used by the Japanese. The Japanese implants into the US market encouraged adoption of such techniques and led to increases in overall US productivity. Increases in Europe came somewhat later, and were probably also caused by Japanese competition and the lessons learnt from Japanese FDI. Figures 6.9 and 6.10 provide an analysis of the changes in the numbers of hours it takes to make a standard vehicle in Western Europe compared with Japan and the US in index and absolute terms respectively.

Figure 6.9. Index of hours needed to assemble a standard car, 1980, 1990 and 1993



Sources: IMVP, E&Y

Figure 6.10. Number of hours needed to assemble a standard car, 1980, 1990 and 1993



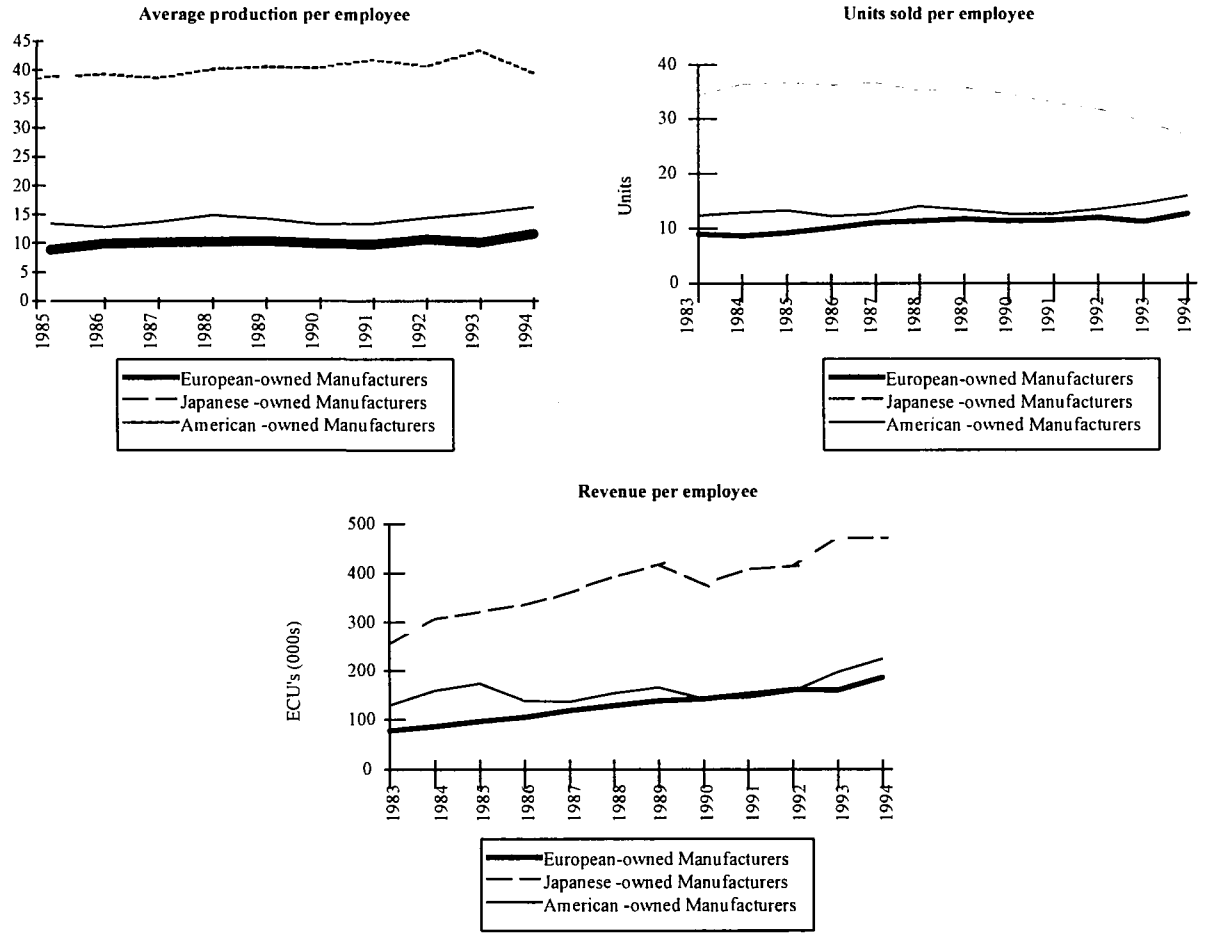
Sources: IMVP, E&Y.

The measure of hours to produce a standard car is notoriously problematic. First, it is difficult to define exactly what a 'standard' car is, especially if we compare the cycle times (the average time each worker spends on a vehicle to add a components). These range from 4 hours for a specialist producer such as Morgan to 15 minutes or less for an Audi A8. Furthermore, the adoption of new production techniques and the changing relationship between manufacturers and components suppliers adds to the difficulties of comparison. With more components suppliers developing systems rather than supplying the components, the manufacturers need to spend less time on assembly (whether they are more productive or not).

Taking these reservations into account, it appears that manufacturers have improved their productivity between 1980 and 1993. Between 1990 and 1993, US producers increased their productivity by 23% and during the same period European producers increased productivity by 29% – a slightly better performance, but the proportional change is influenced by the poorer starting point. The single market programme may have encouraged the Japanese manufacturers to enter the European market. This is because it removed many of the non-tariff barriers to trade and therefore facilitated (or brought forward) the setting up of plants in fewer locations than would have been necessary. Growing competition from these Japanese entrants then put pressure on the European producers to adopt lean production methods. In our discussions with Nissan, we heard how all major European producers have sent teams of staff to view their plant at Sunderland prior to 1992.

Figure 6.11 shows more aggregated information on the changes in revenue per employee, units sold per employee and production per employee. The European production per employee figures are based on samples of European-based companies. The remaining figures are based on world-wide figures for European, Japanese and US manufacturers. Naturally, there are some problems with this type of analysis since legal structures, stockholding strategies as well as accounting regulations and practices and subcontracting strategies differ greatly between Japan, USA and the EU. Figure 6.11, therefore, is only indicative of the changes identified in the analysis above.

Figure 6.11. Additional measures of productivity, 1985–93



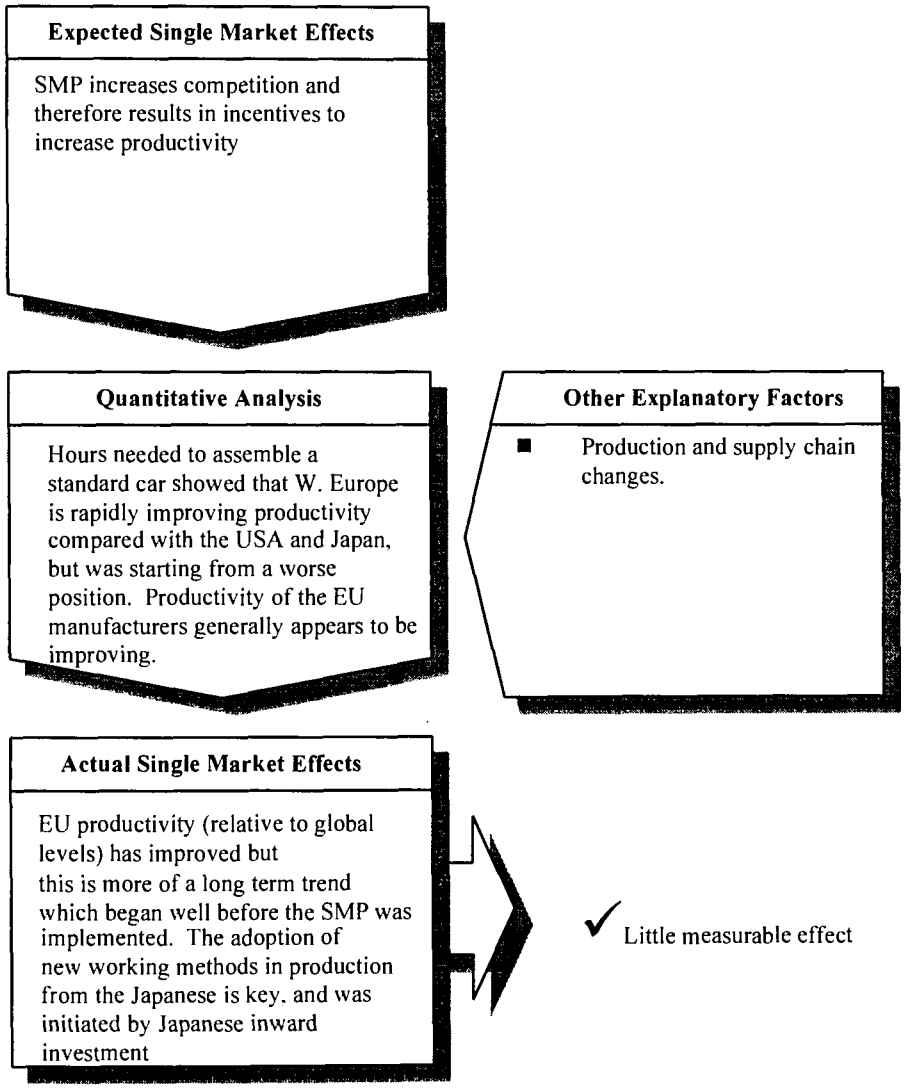
Source: Marketing Systems GmbH.

6.2.4. Actual impact

The analyses emphasize the relatively greater productivity of the Japanese producers, but also show gradual improvements by the European producers. This is consistent with the expectation that the single market programme will increase the productivity of the European-owned manufacturers. However, our case studies revealed that the most important factors in increasing productivity were regarded as the increase of global competition and the inward investment of the Japanese manufacturers in Europe as well as the adoption of new working methods in the late 1970s and early 1980s. Fiat, for example, said that the reorganization it has implemented since the early 1990s is based on the Fabbrica Integrata (Integrated Factory) project, which adopts Japanese working methods. Fiat therefore regards the productivity gains and the cost reductions of recent years as almost entirely due to the implementation of lean production techniques within the integrated factory framework. Renault regards the adoption of Japanese working methods from the late 1970s as the primary reason for its improved productivity.

However, we consider that the single market may have encouraged Japanese market development in the EU, and therefore since the productivity gains can be attributed to Japanese lean manufacturing techniques, the single market programme has indirectly reinforced these changes. The single market programme is one of a number of factors which have increased global competition, which has, in turn, led to improvements in productivity.

Figure 6.12. Summary diagram 11: Hypothesis 11



6.3. Hypothesis 12: Employment will fall

6.3.1. Expected impact

It is expected that the single market will result in increased competition and competitiveness of the EU automotive industry. One of the by-products of this might be a reduction in the level of employment experienced by some manufacturers. This may be as a result of some closures of inefficient plant which were previously maintained by barriers to trade, or through the

adoption of improved manufacturing techniques which may not be as labour intensive. Therefore, although this is not an intention of the single market programme, economists regard falls in employment as an inevitable by-product of increased competition since reducing the costs of labour is an easy way to reduce costs overall.

The implementation of the single market programme is expected to have had an impact on the employment levels of the automotive manufacturers. Removal of barriers to entry increases the level of competition faced by EU-based manufacturers. One of the expected responses to this increased competition is a reduction in employment levels through improved techniques of manufacture and increased reliance on automation. This analysis is closely linked to the previous hypothesis on productivity.

6.3.2. Other factors

In assessing the employment levels of these companies, several other factors need to be taken into consideration:

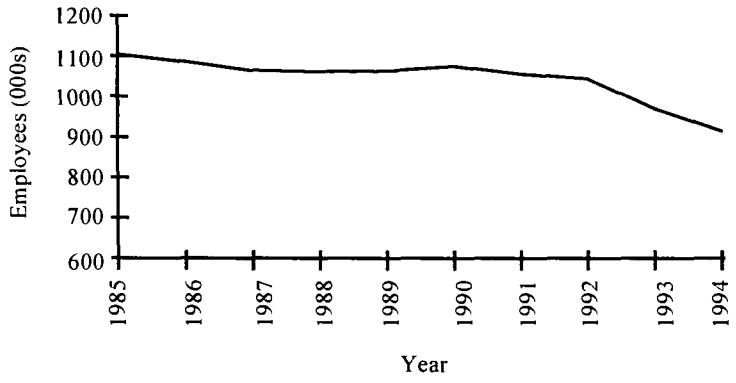
(a) General competition in the automotive industry has been increasing over the last ten to twenty years. In order to compete at this level, changes in the structure of the companies, including employment levels, will have been planned and made.
(b) Employment in the automotive industry will also be highly dependent on market conditions. In times of recession, some companies may reduce employment or reduce working hours, and in times of recovery, employment is likely to increase.
(c) Changes in the level of employment are likely to be made when new products are introduced. Changes in employment at a corporate level, therefore, are likely to be 'lumpy' but in aggregate these changes will be smoothed out.
(d) Changes in the supply chain will also be important. Vehicle assemblers are increasingly outsourcing components suppliers and, consequently, require fewer employees to produce a vehicle.

The single market programme may also have affected the mobility of workers within the EU, therefore increasing competition and lowering wages.

6.3.3. Quantitative analysis – employment levels

Figure 6.13 shows the number of people employed by the EU-owned manufacturers.

Figure 6.13. EU-owned manufacturers' employment in the automotive sector, 1985–93



Source: Marketing Systems GmbH.

Figure 6.13 shows that:

(a) employment in the EU was relatively constant up to 1990 when it went into a shallow decline;
(b) employment declined increasingly from 1992 to 1993.

We have also carried out econometric regression analysis of the determinants of automotive employment. The expectation is that the regression will tell us the exact impact of the single market programme on employment. However, data availability means that the results of this analysis are extremely limited.

We present the results of our regression analysis in Appendix L.

6.3.4. Quantitative analysis – mobility

Our case study of Volvo revealed that the type of company and the markets it serves can play a part in the degree of cross-border recruitment. Volvo is a very international company, selling and producing in a wide range of markets outside its national market. As such, Volvo views the single market programme as helping its generally international outlook. Moreover, as a specialist producer, Volvo has to recruit key staff outside Sweden, because the industry in Sweden is simply too small to support the development of all the specialist skills needed to develop and manufacture motor vehicles.

We found an example of bureaucratic constraints imposed by the Bavarian labour authorities on the transfer of consulting engineers from a UK firm to that region. The firm was asked for:

(a) copies of various contracts of employment;
(b) copies of standard commercial contracts;
(c) documentation from banks confirming the company's financial position;
(d) documentation confirming the directors' tax status;
(e) certificate of compliance from the tax authorities;
(f) individual statutory declarations for each of the Executive Directors;

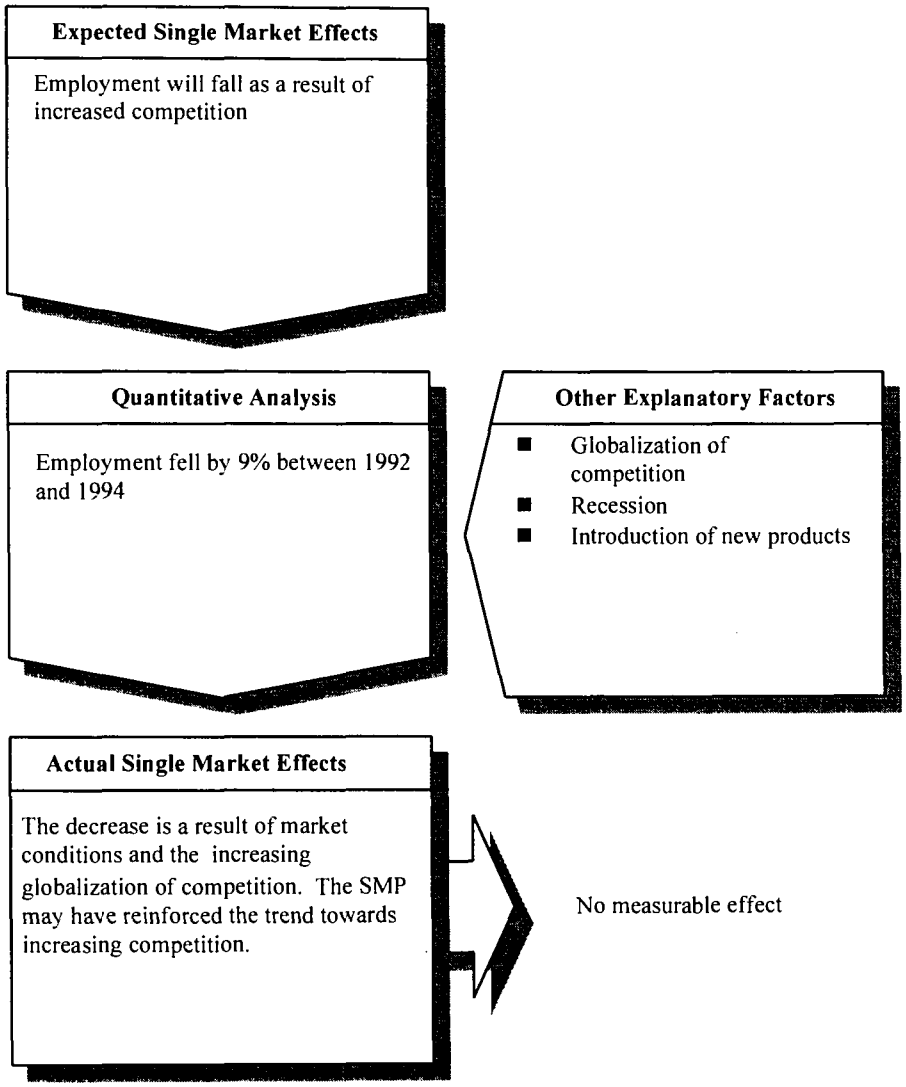
(g) company registration forms 288 and 363 from the UK company registration authority.

The documents took a considerable amount of time to put together and several were returned three to four months later with a request for very minor amendments. All of the documentation had to be translated into German. This was very costly and resulted in significant delays, which had a major effect on the viability of the project.

6.3.5. Actual impact

EU-owned manufacturers' employment has steadily declined during the period shown, falling by 12% over the entire period, although the rate of decline increased markedly from 1992 to 1994 falling by 9% in this period alone. We believe that the change in the rate of decline is likely to have been due to a combination of the downturn in market conditions, continuing competition from increasing globalization and new technology, and that the single market programme reinforced some of the trends to increasing competition. Our case studies revealed that recently the trend to increasing capital intensity has slowed. Indeed, emphasis is on increasing the overall education levels of the workforce to increase flexibility and the ability to carry out more than one task on the shop floor and to be able to adapt to change quicker. The lead in this new 'production technique' has been set by the Korean manufacturers who employ as many graduates as possible on the shop floor.

Figure 6.14. Summary diagram 12: Hypothesis 12



6.4. Hypothesis 13: The structure of investment in the EU will change

6.4.1. Expected impact

The single market programme can be expected to affect the level of investment and location decisions of automotive producers in the following principal ways:

(a) Easier access between EU Member States is likely to result in the long-term rationalization of production on the basis of comparative advantage. Multinational automotive manufacturers already established in several Member States may reorganize their production within the European Union into a smaller number of locations. From these locations they will be able to serve the whole of the EU if the capacity is great enough.

(b) The increased attractiveness of the EU both as a single market and as a location for production might increase the foreign direct investment (FDI) from non-EU sources, such as Japan and Korea. This FDI may consist purely of production facilities, or may include RD&D facilities to counteract potential accusations of 'screwdriver' plants and provide more integrated European operations.
(c) The single market, combined with the increased competition in the market, may also affect the research, design and development (RD&D) function in a number of ways. From non-EU sources, the desirability of an EU location may increase, in order to take advantage of speedier information flows allowing the product design to appeal more closely to European tastes. A 'designed locally' label may also be desirable. In terms of the location of RD&D, the single market programme makes it easier to separate RD&D from production, allowing RD&D to be sited according to comparative advantage.

6.4.2. Other factors

Increasing global competition is likely to play an important part in the decisions of automotive manufacturers to invest in more capacity and new locations. This competition is likely to result in automotive producers choosing cheaper locations for plant. Exchange rate differentials might also play a part in the decision to invest in existing or new plant. Relatively cheaper countries are likely to be favoured for new or increased plant capacity. Furthermore, older locations may have become sub-optimal over time as a result of, for example, site constraints, infrastructure suitability as well as labour practices and norms which restrict the search for greater productivity. Therefore, this may be behind many drives for new locations where such norms and constraints are not present.

Additionally, despite plant closures and over 400,000 redundancies in the early 1980s, the EU automotive market is still characterized by over-capacity. This will affect the structure of investment. Despite the problems of over-capacity, even the possibility of state aid in the mid-1980s failed to induce many closures. The mid-1980s policy of the European Commission was to link state aid to capacity reductions – for example, the £680 million loan to British Leyland Bus and Truck for a 60% reduction in capacity. Aid was also offered to Alfa Romeo, Renault, Rover and ENASA, with the share of aid in the total restructuring costs roughly equivalent to the share of capacity which had to be eliminated. Despite the inducements of state aid and chronic over-capacity, only the following major plants were closed:

(a) Renault at Billancourt;
(b) Rover at Cowley South;
(c) Lancia at Desio and Chivasso;
(d) Volvo at Kalmar;
(e) Seat at Barcelona.

Another factor which will affect the structure of investment is that many manufacturers have plants spread out across the EU as part of the 'Europeanization' of production which was being pursued well before the implementation of the single market. The time lags in making significant adjustments to production are similar to the length of product cycles, so it may be too early to assess the impact of the single market programme on the structure of investment. Moreover, manufacturers have considerable sunk costs in their plants. This creates extreme inflexibility in terms of changes in production locations and new plant development. Because of this inflexibility, some producers might want to maintain lower capacity plant so that they have more flexibility to change production over a short period of time.

6.4.3. Quantitative analysis

Table 6.1 shows a sample of the major investment decisions of automotive manufacturers in Europe since 1985 in new car production, by acquisition, joint venture or greenfield site.

Table 6.1. Major investment decisions of car manufacturers in Europe since 1985 in new car production, by acquisition, joint venture or greenfield site[1]

Date	Manufacturer	Country	Investment type	Amount of investment (million ECU)	Car capacity[2]
1996	GM	Poland	Greenfield site	265	72,000
1995	Mercedes	France	JV (with Swatch)		
1995	Daewoo	Poland	JV (with FSL)		50,000
1994	Chrysler	Hungary	Greenfield site		40,000
1994	Daewoo	Romania	JV (with Oltcit)		120,000
1994	BMW	UK	Acquisition (of Rover)	1,000	500,000
1994	Hyundai	Turkey	JV (with Assan)		100,000
1993	Fiat	Italy (Melfi)	Greenfield site		450,000
1993	GM	Poland	JV (with FSO)		10,000
1993	Mercedes	Russia	JV (with UAZ)		50,000
1992	Ford	Portugal	JV (with VAG)	2,500	180,000
1992	GM	Hungary	Greenfield site		25,000
1992	VAG	Former Czechoslovakia	Acquisition (of Skoda)	5,000	400,000
1991	VAG	E. Germany	Acquisition (of Trabant)		
1991	Honda	UK (Swindon)	Greenfield site	430	100,000
1991	Mitsubishi	Netherlands	JV (with Volvo)		200,000
1991	GM	E. Germany (Eisenach)	Greenfield site	500	150,000
1990	Toyota[3]	UK (Derby)	Greenfield site	990	200,000
1990	GM	Sweden	Acquisition (50% of Saab)	1,000	120,000
1990	Fiat	Poland	Greenfield site		200,000
1989	Ford	UK	Acquisition (of Jaguar)	2,450	100,000
1986–90	VAG	Spain	Acquisition (of Seat)		600,000
1986	Suzuki	Hungary	Greenfield site		50,000
1985	Nissan	UK (Sunderland)	Greenfield site		300,000

[1] Fiat has plans to produce its new world car (the 178) in Poland in the next two to three years. It intends to produce 54% of its cars outside Italy by the year 2000. Ford also has plans to produce vehicles in Poland (30,000 Escort cars and Transit vans by 1998).

[2] Car capacity figures are only illustrative. Car capacity figures for joint ventures (JVs) are for total capacity of the plant. They may change due to model changes or subsequent changes in the investment decision.

[3] Toyota has plans to increase the numbers of cars it manufactures outside Japan from 45% in 1994 to 55% in 1996 to 65% in 1998.

Source: CAIR.

Table 6.1 reveals that:

(a) There have been significant new investments into the EU and neighbouring countries from 1985. To some extent this may be a reflection of automotive manufacturers applying 'rational expectations' by recognizing the benefits of the single market well before its implementation and acting on these expectations through investment in new plant.
(b) Most of the investments in the EU have been in peripheral, non-traditional car making regions in Spain, Portugal, the UK and Italy. This is likely to be a direct response to the single market, new investments being sited because of grants and aid within these regions as well as wider advantages from site suitability, the lack of constraints allowing new layouts and production organization.
(c) A significant amount of the investment in the UK and Spain has been through acquisitions of existing producers, rather than greenfield site production. This provides evidence of rationalization resulting from global competition and the single market.
(d) Recent investment has been concentrated outside the EU in the periphery of Eastern Europe. Some of this will be linked to specific market opportunities in the country of location and low production costs and some, particularly former East Germany, because of the direct links with the West following reunification.

Appendix P provides details of a mini-case study we carried out on Mercedes-Benz/Swatch JV's decision to locate in Hambach in France.

Additionally, however, major investments have also been made by car manufacturers in their existing car engine and components production plants since 1985. This is illustrated in Table 6.2.

Table 6.2. Illustrative major investment decisions of car manufacturers in Europe since 1985 in existing (brownfield) sites (car production, engines and components)

Date	Manufacturer	Country	Investment type	Amount of investment (million ECU)
1994	Fiat	Italy	Car production (new models/plant improvements)	21,000 (half by 1994)
1990–99	Ford	UK	Car production and components	3,200
1986–90	Ford	Spain	Car production	500
1991	Ford	Spain	Engines	800
1995	Ford	Germany	Car production – new metallic paint line	
1995	Ford	Germany	Components assemblies	
1995	Ford	Germany	Engines	800
1990–92	GM	UK	Engines	800
1994–95	GM	UK	Car production	165
1993	GM	Germany	Engines	256
1993	GM	Belgium	Components	150
1993	PSA	France	Car production	450
1993	PSA	Spain, UK	Car production	120
1989–91	Volvo	Belgium	Car production	300
1995–2000	Volvo	Belgium	Car production	

Source: CAIR.

The table reveals that:

(a) there has been substantial investment in existing plant;
(b) the companies making these investment decisions tend to be those that were more pan-European in their production prior to the single market programme.

There have also been major investment decisions by vehicle manufacturers in new components plants. For example in 1995, BMW-Rover invested in a new paint plant in the UK and Mercedes invested in a new engine plant in Germany.

Table 6.3 shows a series of major investments by producers in new RD&D centres.

Table 6.3. Major investment decisions by car producers in new RD&D facilities in Europe

Date	Manufacturer	Country	Investment type
1995	BMW-Rover	UK	Design and engineering centre
1995	Renault	France	New technology centre
1995	Ford	Germany	RD&D centre
1995	Daewoo	Germany	Design centre
1995	Daewoo	UK	Acquired IAD
1995	Ssang Yong	UK	Acquired R&D company
1989	BMW	Germany	New design centre
1989	Nissan	Belgium	RD&D centre
1988	Nissan	UK	RD&D centre
1988	Nissan	Germany	Design centre
1988	Honda	Germany	RD&D centre
1987	Toyota	Belgium	RD&D centre

Source: CAIR.

Table 6.3 reveals that:

(a) The Japanese have been establishing RD&D facilities in Europe, spatially separated from their production sites, in areas traditionally considered strong in automotive RD&D.[7] This would be consistent with the idea that the single market programme is aiding location of functions according to comparative advantage.
(b) Rover and Renault seem to be concentrating their research efforts in one location as much as possible. This again would seem consistent with the single market's potential effects, though Ford's world-wide strategy to locate RD&D in five global centres (each handling a car segment for world production) puts the single market programme effects in the context of wider global changes taking place.
(c) BMW's decision to set up a design and engineering centre can be seen as an attempt to differentiate the Rover brand in technological terms.

[7] It is also interesting to note that the Japanese manufacturers' entry strategy has included setting up distribution centres to supply parts to all their franchised dealers. These distribution centres are based centrally in either Belgium or the Netherlands.

(d) The acquisitive strategies of Daewoo and Ssangyong may signal their intent to set up full production in the EU at a future date and the growing need for car manufacturers to have RD&D capability in a market as large as the EU.

Investment in the EU has, in part, been facilitated by state aid. This aid can be divided into two categories:

(a) aid to support domestic producers;
(b) aid to attract foreign direct investment.

Table 6.4. Examples of state aid

Supporting domestic producers	Attracting foreign direct investment
Renault (1987)	VW in Belgium (1990)
Alfa Romeo (1985)	GM in Portugal (1990)
Rover Group (1986 and 1990)	Nissan in the UK (1991)
Peugeot (1988)	Ford and VW in Portugal (1991)
Volkswagen (1991)	Volvo in Belgium (1992)
Opel (1991)	Volvo and Mitsubishi in the Netherlands (1992)
Fiat (1991)	Renault in Spain (1994)
Fiat and PSA JV (1994)	Mercedes in France (1996)

Source: EC Annual Reports on Competition Policy.

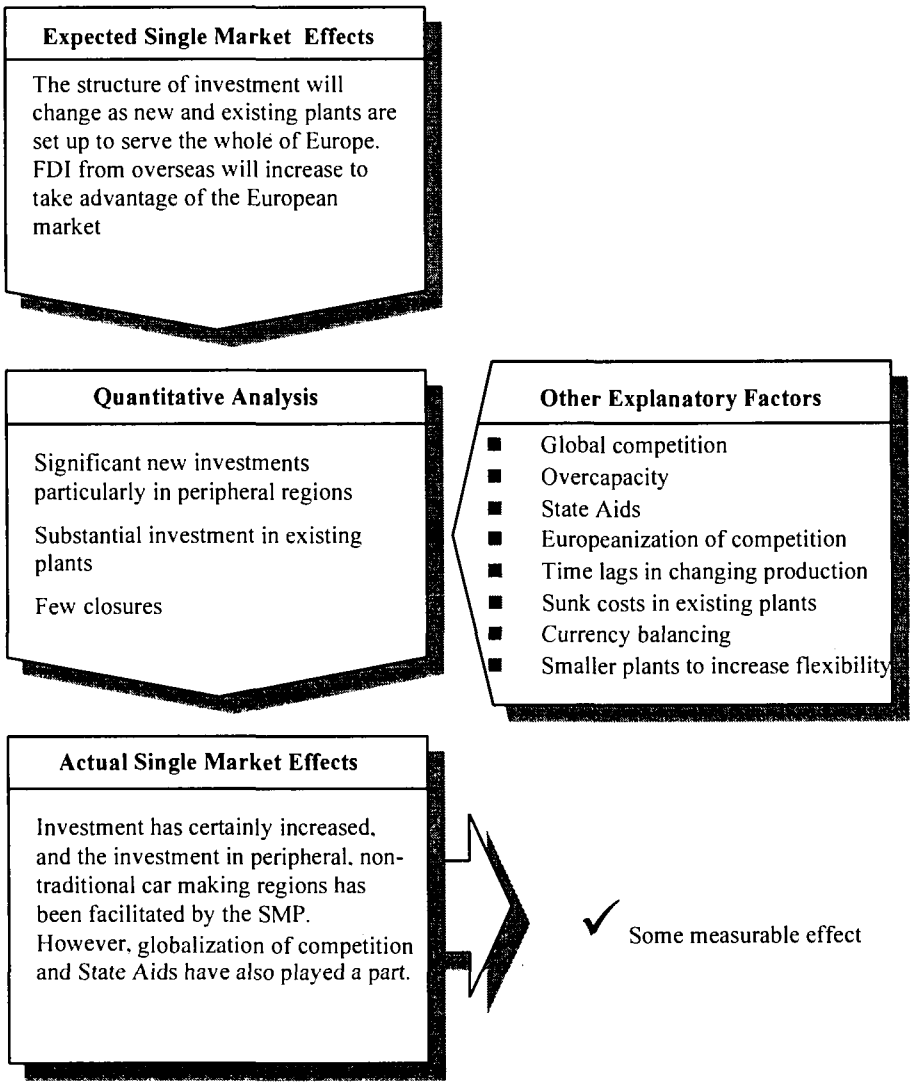
Japanese components firms have not, to date, arrived in the numbers which some European commentators feared – and certainly not on the scale which has been evident in the North American market. This may be attributed to the following factors:

(a) lower absolute level of Japanese capacity in Europe;
(b) political sensitivity over the issue, leading to greater amounts of business being placed with existing suppliers in Europe;
(c) recession in Japan reducing investment funds available;
(d) consolidation of investments in North America;
(e) greater opportunities in South-East Asia;
(f) greater use of technology licence arrangements with European partners.

6.4.4. Actual impact

The evidence concerning the recent investment decisions of car manufacturers in the EU is generally consistent with the potential effects of the single market programme. However, one must also be aware that these trends are also discernible in the wider global industry and were being pursued to an extent before the implementation of the single market programme. It is also the case that the lack of plant closures in the EU, when seen in addition to the new plant being built in more optimal locations, presents the potential for over-capacity in the future. This may mean that the long-term rationalization of production on the basis of comparative advantage will not take place through planned company action but via a much more competitive European market.

Figure 6.15. Summary diagram 13: Hypothesis 13



6.5. Hypothesis 14: Component supply structure has become more pan-European

6.5.1. Expected impact

The removal of barriers to entry as a result of the single market programme is expected to result in an increase in competition in the components supply sector. There are likely to be two possible responses to this:

(a) purchases becoming more internationalized to reduce costs;
(b) the internationalization of suppliers as they adapt to their increasingly competitive environment.

6.5.2. Other factors

General improvements in the system of supply is another factor which needs to be considered. There have been moves over the last 10–15 years to improve production techniques through lean distribution and production as competition has increased. In some cases, these require suppliers to be located close to the manufacturers, limiting the likelihood of cross-border sourcing. Length of contracts and the development of long-term relationships with suppliers are also likely to affect the impact of single market implementation. Differences in currency will play a part in the decision of manufacturers to buy components from certain companies. The relative impact of the recent recession on some companies will affect both the decision to supply and the decision to purchase.

It must be noted that volume manufacturers tend to balance the choice of best supplier with the choice of location of supplier. This leads to a range of strategies in which pre-manufactured and part-assembled components are supplied to an intermediary subassembly plant alongside the volume manufacturer. This intermediary then supplies components and systems JIT to the volume manufacturer.

We present our analysis below in the following way:

(a) internationalization of purchases:
  (i) cost savings resulting from cabotage and reduction in border delays,
  (ii) intra-EU trade in components,
  (iii) the Irish components sector,
  (iv) the Portuguese components sector;
(b) internationalization of suppliers:
  (i) mergers and acquisitions,
  (ii) nationality of ownership of the supply base,
  (iii) leading components suppliers;
(c) exchange rates and sourcing patterns.

6.5.3. Quantitative analysis – internationalization of purchases

We have contacted NEA (the firm carrying out the related study on the effects of the single market programme on freight and transport[8]) and they have been able to provide us with some information which indicates the cost savings resulting from the single market programme. The savings which they have indicated will provide incentives for vehicle manufacturers to procure components on a pan-European basis. Table 6.5 shows the estimated reductions in transport costs as a direct result of the single market programme, broken down by the savings attributed to cabotage, and those associated with the elimination of border times.

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[8] *The Single Market Review*, Subseries II: Impact on services, Vol. 5: Road freight transport, Office for Official Publications of the EC and Kogan Page Publishers, 1997.

Table 6.5. Changes in intra-EU transport costs and time

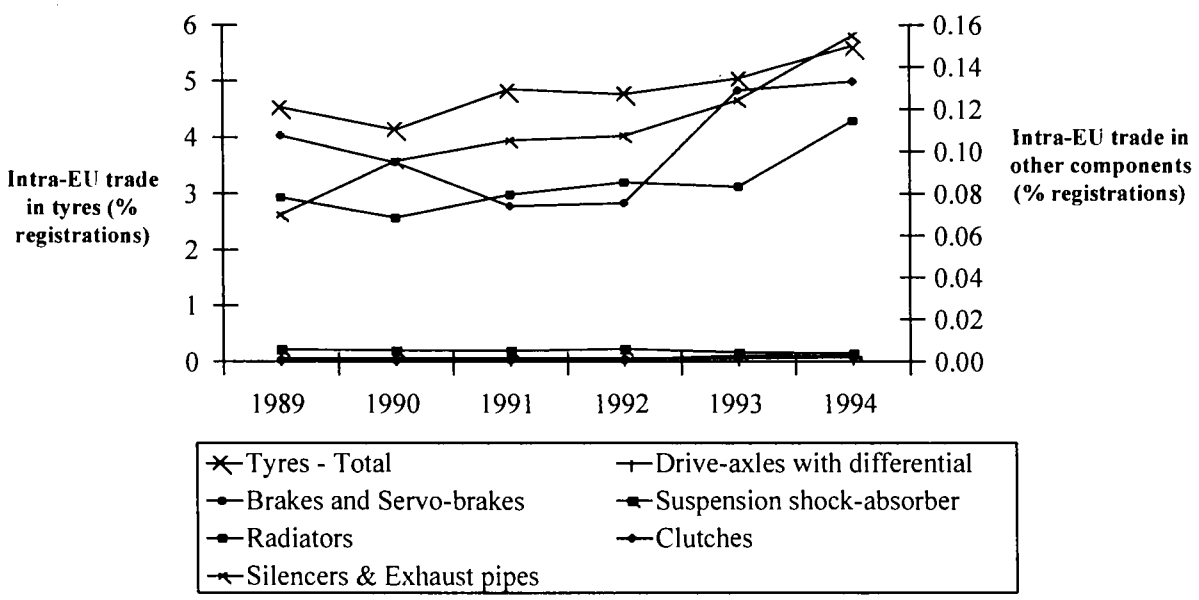
Nationality of haulier	Cabotage/cross-border trade transport cost reductions (%)	Elimination of border times (%)
B	-4.1	-2.0
D	-3.3	-2.1
DK	-4.1	-2.1
E	-3.3	-1.8
F	-3.3	-2.0
UK	-3.3	-1.9
GR	-4.1	-1.9
I	-3.3	-2.1
NL	-4.1	-2.1

Source: NEA.

Table 6.5 shows that there have been cost savings in cabotage and the elimination of border delays. It is likely, therefore, that there may be some internationalization of supply by the automotive manufacturers because of this reduction in costs.

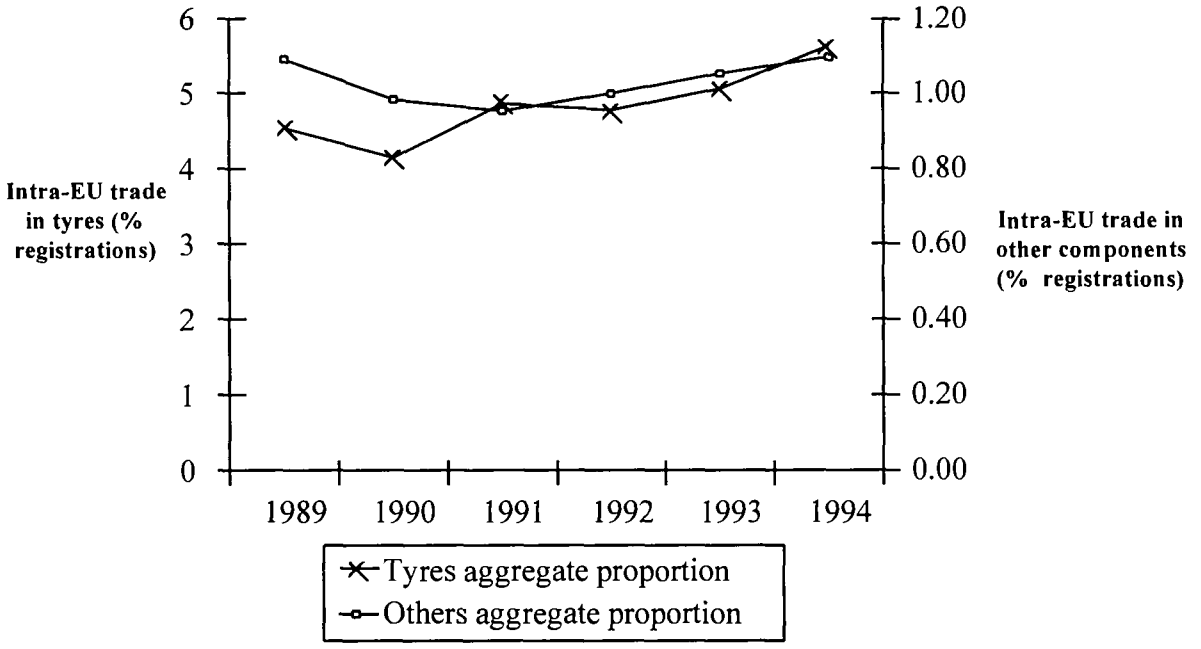
Figures 6.16 and 6.17 show the intra-EU trade of a selection of car components relative to the number of registrations. Dividing by registrations means that any changes in market conditions are factored out, making the assessment of the single market impact easier. Figure 6.16 has each components considered separately and Figure 6.17 considers components in aggregate. Intra-EU trade in tyres is of a different order of magnitude than the other components in our sample, and is considered separately.

Figure 6.16. Intra-EU trade in components, 1989–94



Sources: E&Y, Eurostat.

Figure 6.17. Intra-EU trade in components, in aggregate, 1989–94



Source: E&Y, Eurostat.

The figures show that:

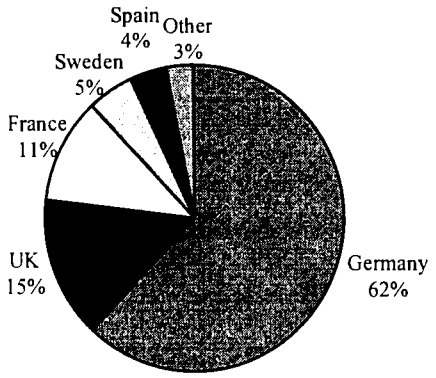
(a) The cross-border flows of components are generally low compared to registrations, indicating that there is some way to go before a more internationalized flow is established.
(b) Intra-EU trade in tyres fell between 1989 and 1990 but then recovered through the rest of the period. Other components in aggregate fell until 1991 but then recovered afterwards.
(c) Intra-EU trade in components does not appear to have been affected by the single market programme.
(d) The overall trend in intra-EU trade in components is increasing, but this trend started well before the single market programme.

The internationalization of purchasing has been most pronounced from vehicle assemblers based in Germany. Mercedes, for example, which in 1985 purchased 90% of components and materials from within Germany plans to reduce this to 75% by the year 2000. VAG has established purchasing offices in the UK, France and elsewhere with the explicit intention of purchasing more in these countries. The growth of production in Spain based on vehicle assemblers from Germany (Ford, Opel, VAG) and France (Renault, PSA) has encouraged suppliers from those countries to establish operations in Spain. While it is the case that French vehicle assemblers are generally in favour of retaining spending within France, a greater share of purchases are with non-French-owned companies. In addition, with the adoption of new working methods by the European automotive manufacturers, especially just-in-time (JIT), there is an increasing tendency for components suppliers to locate in the locale of the manufacturer's plant. This will tend to mitigate any increase in cross-border sourcing. For example, in 1993, Nissan used 197 European suppliers which accounted for an annual

expenditure of ECU 1 billion. Two-thirds of the suppliers were located in the UK, 30 of which were immediately surrounding the plant.

The growth of the automotive components industry in countries such as Ireland is indicative of the pressure to purchase components on a pan-European basis and to seek out lower cost locations. It is significant that much of the components industry in Ireland is owned by German interests, and that the bulk of exports are to Germany. In the decade to 1990, exports of components from Ireland grew by about 20% per year to reach ECU 340 million in an industry of about 100 firms and 10,000 workers – despite the lack of an indigenous vehicle assembly capacity. Investment support ranges from outright grants to the provision of worker training courses. Figure 6.18 provides an analysis of the export destination of components from Ireland in 1991.

Figure 6.18. Export destination of automotive components from Ireland, 1991



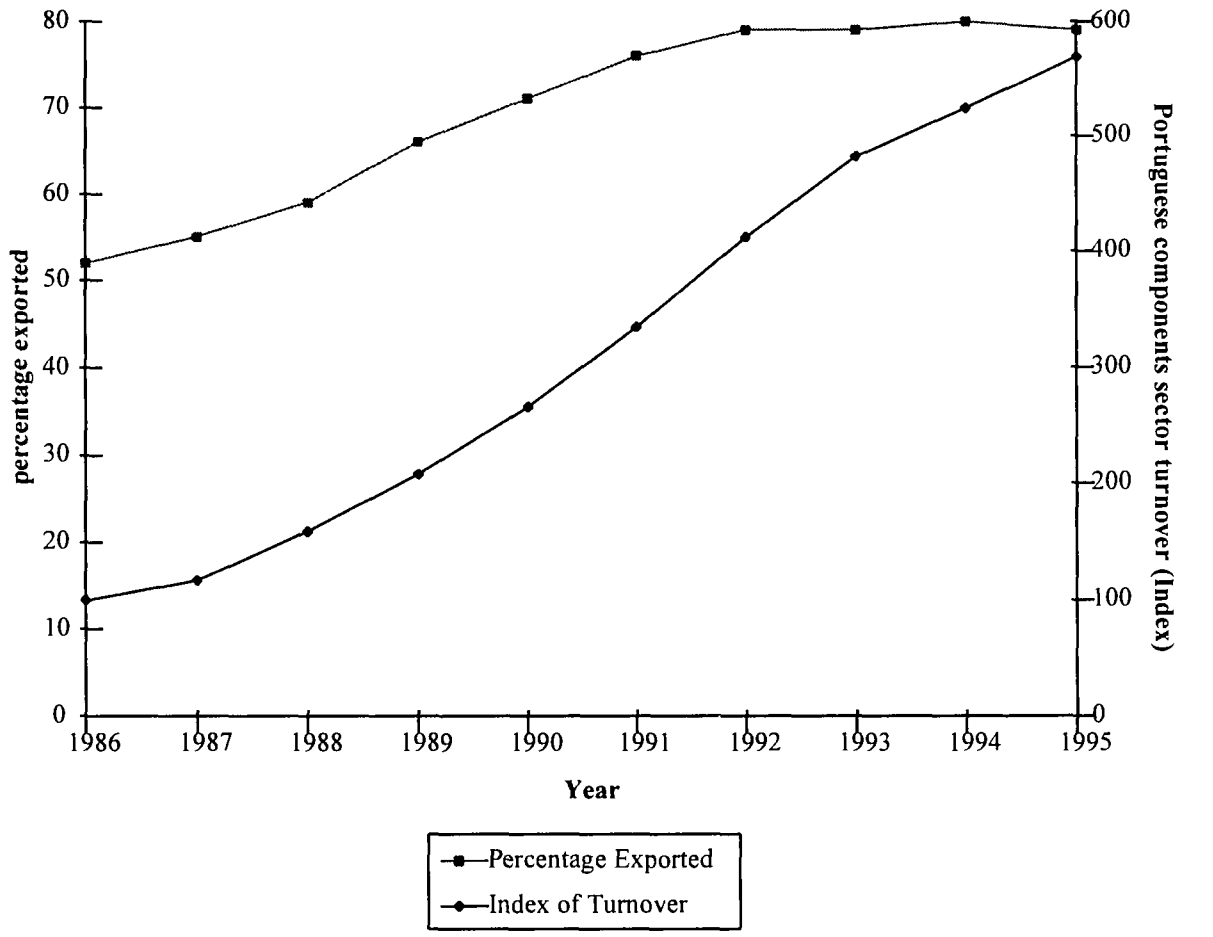
Source: IDA.

ANFIA, the components trade association in Portugal, has collected information on the growth of the national components industry and its dependence on the national market. Figure 6.19 provides this analysis.

The figure reveals that the components sector has grown to over five times its original size over the past ten years. Exports as a percentage of turnover have increased from 53% in 1986 to 79% in 1995. The majority of exports go to Germany (28%), France (24%) and Spain (22%). This growth indicates the scale of the increasing focus on peripheral regions of the EU for automotive production. We discussed this in some detail in Section 5.5.

Some manufacturers have begun to adopt a more pan-European strategy for the supply of components within the firm. Ford-Europe, for example, produces all transmissions for all Ford variants in Europe in one plant in France. There are, however, limits to this policy. For example, because of concerns for security of supply, Ford-Europe produces engines from more than one plant in Europe. This ensures that if one plant is shut down, production of the final product can continue using engines from other parts of Europe.

Figure 6.19. Growth in the Portuguese components sector, 1986-94



Source: ANFIA.

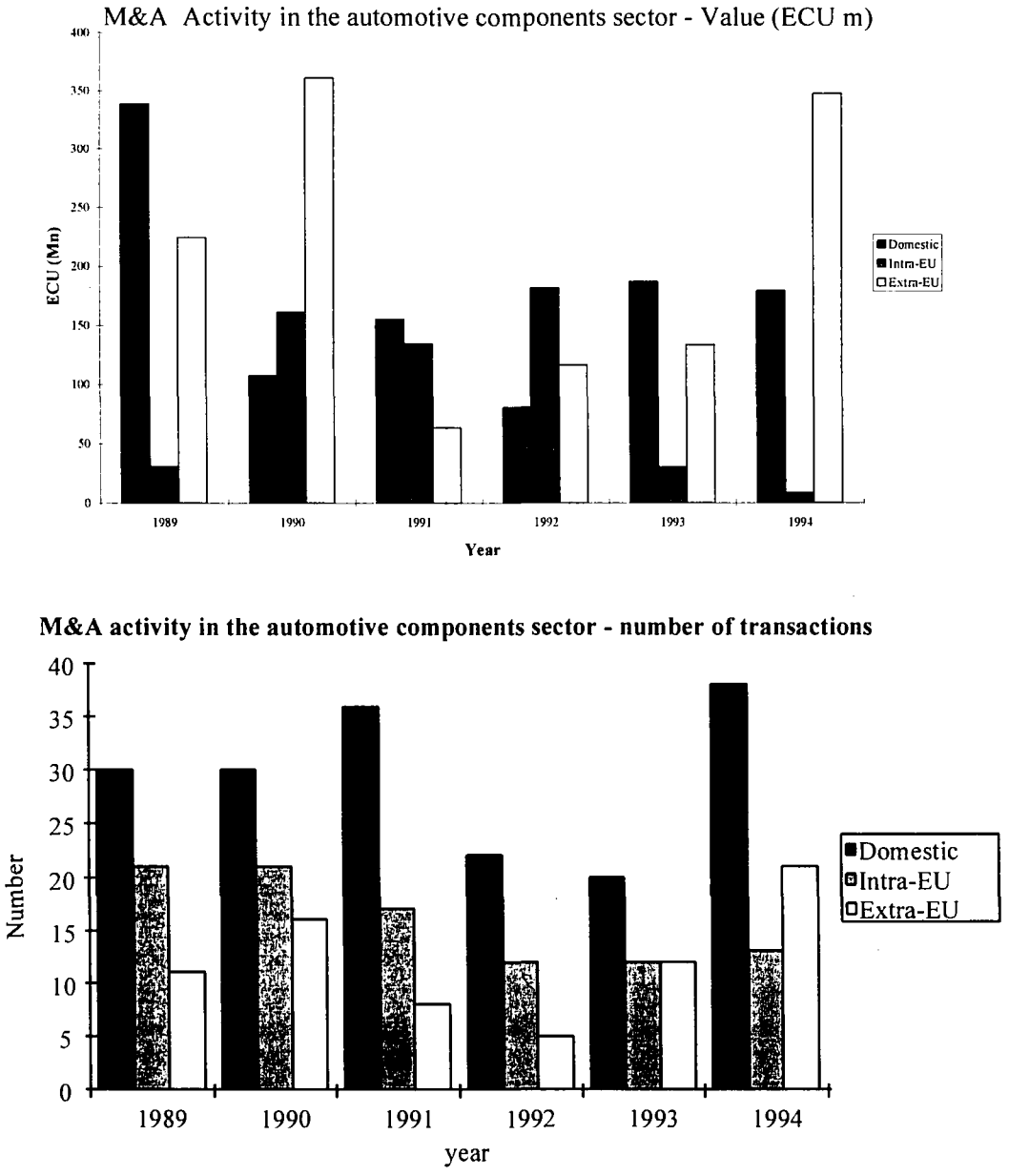
6.5.4. Quantitative analysis – internationalization of suppliers

The sector as a whole shows a considerable degree of 'turbulence' in the form of:

(a) acquisitions;
(b) joint ventures and other alliances;
(c) greenfield investments, including FDI;
(d) plant closures and sales;
(e) exits and entrances to the automotive supply base.

Figure 6.20 shows the mergers and acquisitions (M&A) activity in the automotive components sector for the EU Member States between 1989 and 1994, split by domestic, intra-EU and extra-EU transactions. The first chart in Figure 6.20 shows the transaction in value terms (in ECU), and the second shows the actual number of transactions. These figures do not include joint ventures which are considered in our section on business strategy and covered in more detail in Appendix M.

Figure 6.20. M&A activity in the automotive components sector, 1989–94



Source: Economists Advisory Group.

The figure shows:

(a) for both analyses, and for each of the three measures, M&A activity appears to be cyclical, falling at the middle of the period and then recovering;
(b) domestic M&A activity is greatest in number – 176 in total for the period, but extra-EU M&A activity is of the greatest magnitude – ECU 1,109.5 million for the period (current exchange rates).

Table 6.6 shows the nationality of ownership of components supply companies in a number of Member States.

Table 6.6. Nationality of ownership of sample automotive components companies in selected EU countries (% of total)

Country of ownership	Germany	Spain	France	Italy	UK	Japan	USA	Other	Sample size
Country of location									
Germany	**86.2**	0.0	0.9	0.6	2.4	0.0	7.4	2.1	321
Spain	17.0	**41.0**	10.0	1.5	10.0	1.5	13.9	4.6	129
France	12.6	0.6	**60.2**	3.0	7.8	0.0	12.0	3.6	166
Italy	4.5	0.0	7.5	**57.5**	3.0	1.5	24.0	1.5	66
Portugal	18.8	2.8	7.2	1.4	2.8	0.0	8.6	**57.8**	69
UK	10.1	0.0	3.1	1.8	**54.4**	5.6	24.0	0.6	158

Sources: Italy: AFIA; Spain: SERNAUTO; France: FIEV; Portugal: ANFIA; UK: SMMT; Germany: VDA.

Note: Analysis based on membership of relevant organizations, which tends to distort data by over-emphasis of 'domestic' companies. Analysis based on companies listed, not on number of plants, employment, turnover, etc. JVs attributed to dominant country member, 50/50 JVs allocated to domestic. In practice this table understates the extent of internationalization because the international companies tend to be larger and more orientated towards original equipment work.

Table 6.6 shows that the majority of automotive components companies are domestically owned. However, US companies own significant shares of the automotive components sector in each of the Member States. Japan's presence is felt most in the UK. Germany has the most significant share of the automotive components sector in its own territory and in other Member States. It would be wrong to assume that Germany is closed off from competition – success should not be equated with barriers to entry.

It is clear that the automotive components industry is relatively 'internationalized', even from this snapshot of sector ownership.

Table 6.7 shows some of the leading components suppliers.

Table 6.7. Leading European components suppliers (approximate ranking)

Company	Country	Product area
Michelin	France	Tyres
Robert Bosch	Germany	Automotive electronics
Continental	Germany	Tyres
Pirelli	Italy	Tyres
ZF	Germany	Transmissions
Valeo	France	Lights, wipers, air-con, automotive electronics
Magneti Marelli	Italy	Automotive electrics
Thyssen	Germany	Steel, engineered products
GKN	UK	CV joints, engineered products
Lucas	UK	Automotive electrics, brake systems
BTR	UK	Mainly rubber products
Hella	Germany	Lighting systems
Pilkington	UK	Glass
Freudenberg	Germany	Elastomer-metal products
F&S	Germany	Clutches
T&N	UK	Powertrain products, friction products
ECIA	France	Exhausts, interior trim
Siemens	Germany	Engine management systems, electronics
SKF	Sweden	Bearings
BFA	France	Seats
VDO	Germany	Instrument clusters
BBA	UK	Brakes, clutches
Teksid	Italy	Aluminium castings
Saint Gobain	France	Glass

Source: CAIR estimates.

Germany, France, Italy and the UK have the main components suppliers. These countries with the longest histories in automotive manufacture are likely to have a large presence in the components supply sector. Barriers to entry prior to the Common Market and the single market encouraged components supply sourcing from within the national boundaries. This history will add inertia to the process of cross-border supply, although new countries are being sought by these components suppliers for locating production. For example, Renault explained that in their view, the location of their suppliers has not been affected by the single market programme: most of the contracts with its suppliers are long-term and based on mutual long-term understanding and trust. Whilst these constraints may well delay internationalization in the short to medium run, in the longer run one would expect greater flexibility. However, the components industry is in a state of flux with Bosch's UK £1 billion take-over of Allied Signal brakes and the impending sales of Lucas and Valeo.

6.5.5. Quantitative analysis – exchange rates and sourcing patterns

Our case studies revealed the effects of exchange rate fluctuations on sourcing patterns both for intra-firm trade and for extra-firm trade. Procurement strategies differ between companies,

but overall the major assemblers try to balance the proportion of supplies sourced in individual countries to the levels of demand across the countries. In this way, they seek to offset exchange rate risks. Other factors (such as the high sunk costs in existing plants and lower labour costs in some regions) also play an important role and it is clearly difficult for the companies to balance supplies across countries in an exact manner. The degree to which companies can take into account favourable changes in currency is also limited by the contractual arrangements which assemblers have signed with their major suppliers.

Certain companies are clearly more exposed than others. During our case study exercise, we found that Fiat has benefited from the devaluation of the Lira because it primarily sources its components in Italy. Such a sourcing strategy will have the opposite effect and will harm its exports if the Lira appreciated in value. The devaluation of the Peseta had a minor effect on the Ford plants because its strategy was to hedge its currency risks by sourcing its supplies in Germany and France. Car pricing information collected by the European Commission shows that prices in the overall Spanish market remained relatively constant but fell in Italy in ECU terms.

The effects are felt both for intra-firm trade (for example, Ford's decisions on the relative outputs of its engine plants), and for extra-firm trade.

6.5.6. Actual impact

In general terms, we conclude that there has been an internationalization of sourcing in both senses:

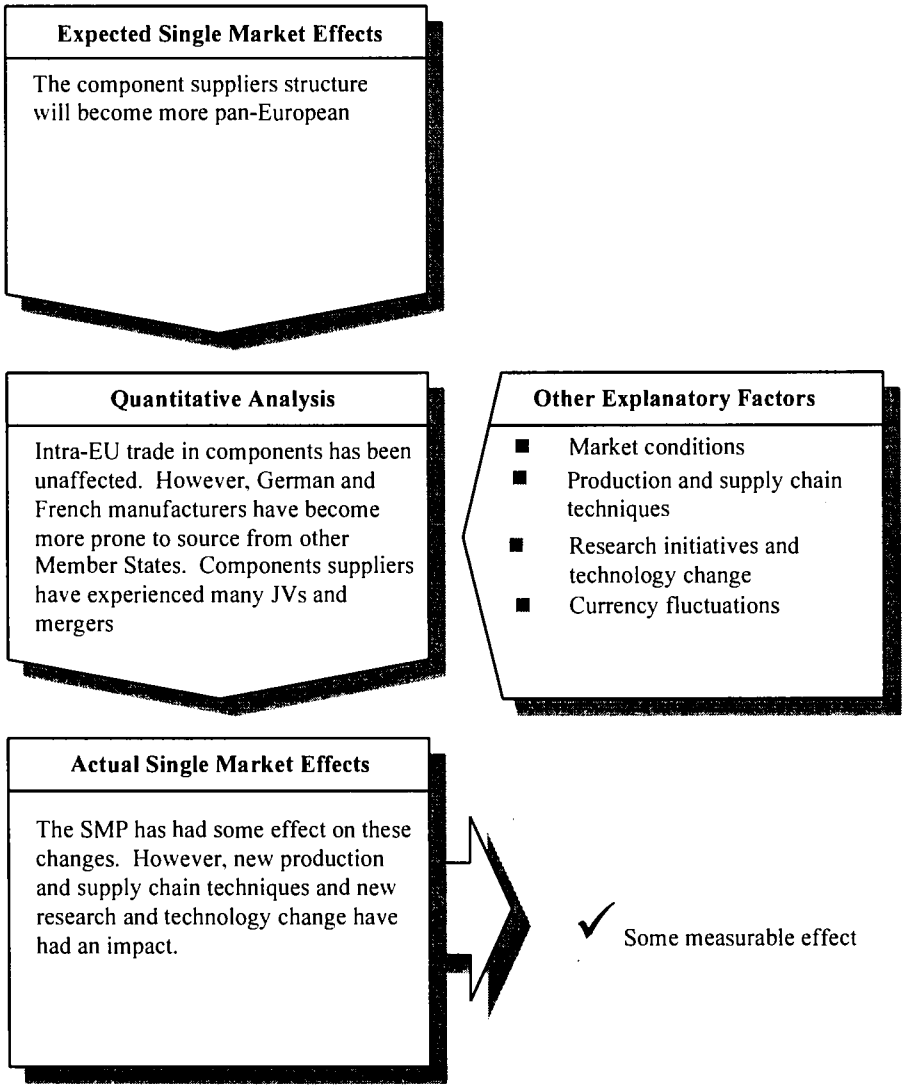
(a) internationalization of purchases;
(b) internationalization of suppliers.

The two are of course closely related, and arise in the main from the strategic response of the components sector to changes in purchasing strategy by the vehicle assemblers in Europe. For vehicle assemblers, purchasing regimes which seek the 'best' available international suppliers may well have to look beyond national borders, giving rise to an internationalization of purchasing. Moreover, in order that current suppliers should expand their capabilities, vehicle assemblers are encouraging their suppliers to win new business in new locations. This even applies to the in-house suppliers owned or part-owned by the vehicle assemblers who also are expected to win new business outside the parent group.

At the same time, new capacity in new locations (such as the Fiat Melfi plant in southern Italy, the Seat Martorell plant in Spain) includes space alongside the assembly facilities for key suppliers who may be 'pulled' to the location from other countries. Certainly, Fiat believes that there will be less cross-border sourcing because of lean production techniques, rather than more. Volvo finds that the search for the best supplier is constrained by the need to secure short lead times for the delivery of components to the assembly plants. Volvo defines a broad geographic area which fixes the limits of secure supply to meet lead times. Beyond this area special measures need to be taken (for example, extra stocks may be held) and this makes locations outside the secure area relatively unattractive. About 60% of Volvo's spending is on just in time or small batch deliveries, and this has reduced the extent of 'long distance' sourcing. However, as explained earlier in this subsection, 'near' sourcing can be carried out through intermediary plants, so this may not be such a hindrance to internationalization of purchasing and suppliers.

It is interesting to note that GM has adopted a global sourcing approach to suppliers and Ford is moving to a World-wide Integrated Purchasing System, suggesting that internationalization of purchasing is the way ahead for the automotive sector.

Figure 6.21. Summary diagram 14: Hypothesis 14



6.6. Hypothesis 15: RD&D costs will fall

6.6.1. Expected impact

The effects of the single market programme on research, design and development (RD&D) can be broken down into three broad areas:

(a) cost savings arising from the components type approval measures, which may affect original equipment manufacturers (OEMs) as well as components manufacturers;

(b) cost savings resulting from the whole vehicle type approval measure which mean that the vehicle manufacturer is only required to gain type approval from one Member State for the rest of EU, rather than having to apply to each Member State in which the car is to be sold;
(c) rationalization of RD&D which we discussed in Section 6.4.

6.6.2. Other factors

The effect of the type approval measures is unlikely to have been affected by any other factors. The rationalization of the RD&D function is likely to have been affected by the overall globalization of the sector as we discussed in Section 6.4.

Components type approval measures

- Expected impact

The components type approval measures were based on standards set up by the Economic Commission for Europe of the United Nations (UNECE). Mutual recognition of standards was laid down by UNECE in 1958 (the so-called March 1958 Agreement). The EU's components type approval measures, which largely brought these previous standards into European law, are therefore unlikely to have had a major effect.

- Quantitative analysis

In order to determine the actual effects of the components type approval measures, we carried out mini case studies with three components:

(a) tyres
(b) headlights
(c) exhausts.

These components were chosen as they were considered likely (through their function and value) to illustrate the effects of the single market programme on both components suppliers and OEMs.

For each components, we interviewed a number of companies in order to investigate their views on the cost savings arising from having fewer variants of their products across the EU. We summarize the findings below, and present the full output from each case study in Appendix K.

- Actual impact

Our tyres case study revealed that UNECE regulations covering tyres had been in place for at least ten years prior to the adoption of the Directive covering type approval for tyres (92/93/EEC), and that the EU Directive was identical in the standards it set. The implementation of the Directive had no effect on changing the nature of the products being produced across Europe, and no effect on RD&D.

Our case study on headlights showed a similar result and noted that standards were already in place before the introduction of the Directive. Interestingly, the headlight manufacturers said that significant costs were incurred through having to provide variants for right hand/left hand

driving and the offering of wipe/wash extras. In addition, the companies noted that the standards adopted within Europe were very different from those in Japan and North America.

Our case study on exhausts provided different results since the market for exhausts in Europe is significantly more complex than the market for tyres and headlights. Sourcing of exhausts varies widely across the EU and there has been a significant proliferation of types per model range. The most important influence on variant costs arises from vehicle assembler strategy on platforms, model variants and engine/transmission choices.

Whole vehicle type approval

- Expected impact

We would expect the whole vehicle type approval to have resulted in a reduction in costs because new models need to be approved by only one Member State rather than all of them.

- Quantitative analysis

Cost savings arising from the whole vehicle type approval can be calculated at a number of different levels:

(a) Tests required to get a new vehicle approved need only be carried out in one country rather than in all Member States. Each national vehicle certification agency used to request three or four variants of each model in order to approve the new car. Each of these models could potentially be different. Since the vehicles provided are made with 'soft' tools, they were expensive and the requirement to produce a large number of variants added significantly to the overall costs. Around three cars of each variant are required, since a separate vehicle has to be put through a front, side and rear impact test. Since the vehicle manufacturer now has to go to only one Member State rather than all 15, it will save the cost of the cars used in these (extra) tests. Each type approval requires around three cars, and so the potential saving is, say, ECU 30,000 (for the vehicle) multiplied by three (cars which would have been used) multiplied by 14 (Member States). This amounts to some ECU 1.2 million for each new model launch.

(b) There are consequent reductions in the time to market resulting from the whole vehicle type approval. Prior to the measure, each country took substantially different amounts of time to approve the same vehicle. For example, type approval in Germany could last some six months, compared with three months in the UK. Our research also indicates that the RD&D costs of a new vehicle amount to some ECU 400 million and the process takes around 36 months. If whole vehicle type approval has resulted in a time saving of around three months, and on the assumption that the development team needs to be kept active, then this represents a maximum saving of around ECU 30 million.

(c) Given the time savings in gaining type approval, the vehicles used in this test are produced later on in the development cycle, which costs less as the manufacturing tooling and assembly works are more developed. The type of vehicles used during the development cycle are as follows:
    (i) mule vehicle, which is a very early prototype and may cost ECU 300,000 per vehicle;
    (ii) Phase 1 prototype which is hand-built;
    (iii) Phase 2 prototype which uses 'soft' tools;
    (iv) pilot built which costs between ECU 25,000 and ECU 40,000;

(v) volume production costing around ECU 12,000 per vehicle.
The crash test which is required for each specified type or model of car to be approved by the authorities must use production-built vehicles. Manufacturers' evidence suggests that the cost savings resulting from using a car later on in the development cycle amount to some ECU 30,000 per model.

(d) There are cost savings from having fewer staff involved in the type approval process. We understand that one manufacturer has reduced the levels of staffing by 14 as a result of the measure. This amounts to an annual saving of around ECU 600,000 for this company.

(e) There are fewer administrative charges from each country carrying out the test. The VDA told us that prior to European type approval, the cost of national type approval in Germany was ECU 740 and around ECU 11,100 for all Member States. The VDA now charges ECU 900 for a whole vehicle type approval. The harmonized system has therefore resulted in administrative cost savings of around ECU 10,400 for each whole vehicle type approval.

- Actual impact

All of these savings can be attributed to the single market programme. The direct savings, for example, total ECU 1–1.5 million for each model launch, and further indirect savings may approach ECU 30 million.

Rationalization of RD&D

We covered the key decisions to invest in independent RD&D centres in Section 6.4, and noted that these new investments were in part attributable to the single market programme. There have also been some changes in the way the RD&D process has been undertaken.

The RD&D process can be characterized in the following way:

(a) sequential/functional/linear,
(b) parallel/functional,
(c) parallel/team and leader.

Historically, the European automotive sector has tended to adopt a linear and sequential approach to RD&D. This has largely been replaced by some sort of parallel development approach. However, a number of Western companies are seeking to introduce an approach usually associated with Japanese companies, entailing parallel development within a small core team and a specific project leader.

- Sequential RD&D

Under this approach the various functional elements of the vehicle manufacturer organization would come into the process at discrete points, after the previous function had finished. Thus, for example, the vehicle engineering team would put together the total design and then hand it over to production engineering, who would seek to develop systems to actually make the car. They would then hand over to marketing, who would think about how to sell the vehicles produced.

- Parallel/functional RD&D

The above process has been replaced by various attempts at parallel development in which the functional elements involved work on the project at the same time or with strong overlaps in time. Thus, marketing would be involved at the product styling and conception stage, manufacturing engineering would be involved at the styling stage.

This leads to increased co-ordination costs at the front of the development process, but also greater time savings later on – essentially a matter of improving the 'right first time' performance.

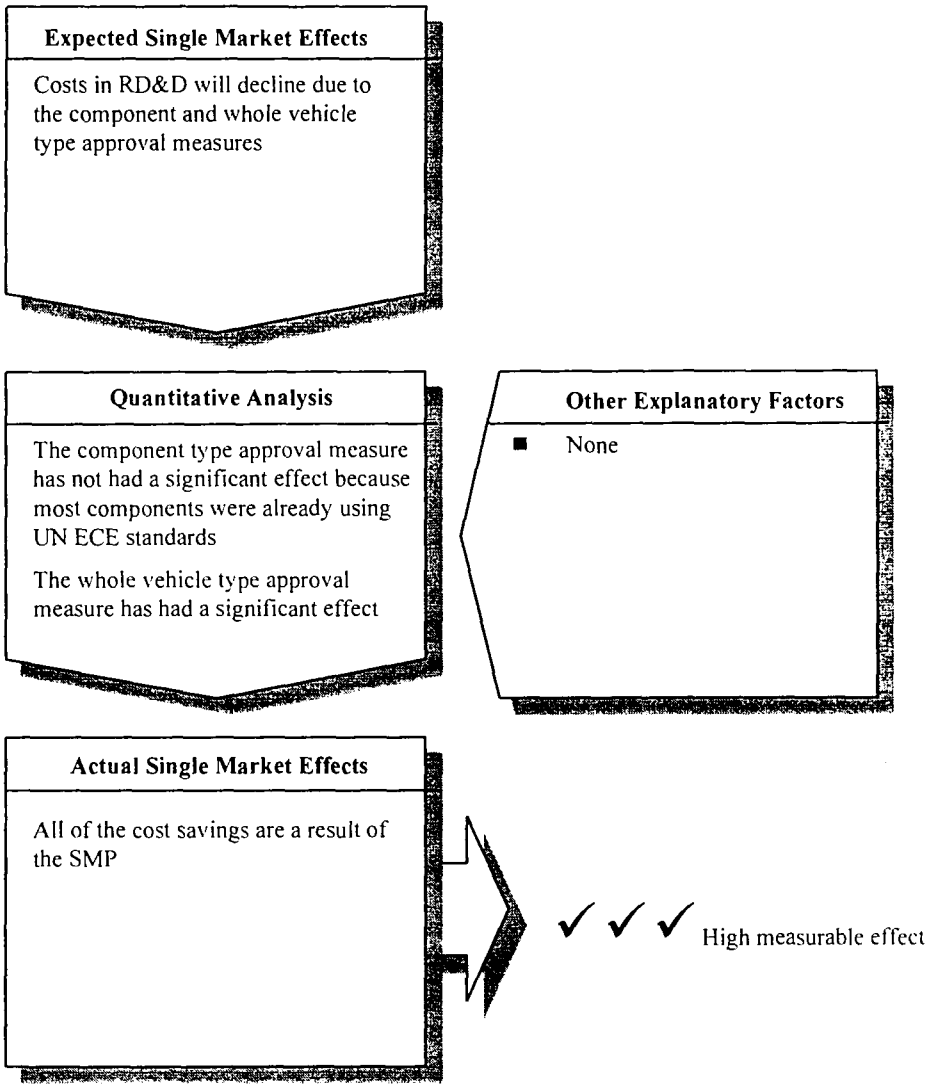
- Parallel/team and leader

This is an emulation of Japanese practice in which an individual takes charge of the entire vehicle development process, and builds a small cross-functional team which also remains in place over the entire process. The team is a temporary organizational structure which takes seconded staff from the various functional elements of the company and, usually, concentrates loyalty to the product rather than the functional elements of the company. Design times are reduced and co-ordination improved.

In Europe, Renault has been quite successful in using this approach, for example to design the Twingo. Development times were under 24 months, and the product has unusually bold styling with a high degree of styling integrity.

We questioned companies about the development of parallel RD&D processes. They told us that the single market programme has not been a direct influence on these changes. However, most of the changes were influenced by the Japanese approaches. Given that Japanese investment into Europe may have been caused to some extent by the single market programme, the single market may have had an indirect effect.

Figure 6.22. Summary diagram 15: Hypothesis 15



7. The impact on global competitiveness

We have now considered all aspects of the hierarchy of hypotheses which look inwards at the impact of the single market programme on the EU Member States. There is one final hypothesis remaining to be tested, which is whether the global competitiveness of the EU-owned automotive industry has increased. This chapter looks at this hypothesis.

7.1. Hypothesis 16: Global competitiveness of the EU-owned automotive industry will increase

One of the main objectives of the single market is that it should result in the EU-owned automotive manufacturers becoming more competitive on the world market. In the previous chapters, we have examined the impact of the single market programme on the marketing, production, purchasing and RD&D functions of the EU automotive manufacturers. Improvements in each of these areas will lead to a more competitive product produced by the EU-owned automotive manufacturers. These products should be more attractive to markets other than the EU because of a more competitive price, better technological specifications and more transferable standards.

7.1.1. Expected impact

Improved competition within the EU is expected to increase the value and reduce the costs of EU manufactured products. This, in turn, should result in the EU manufacturers becoming more competitive compared to non-EU manufacturers.

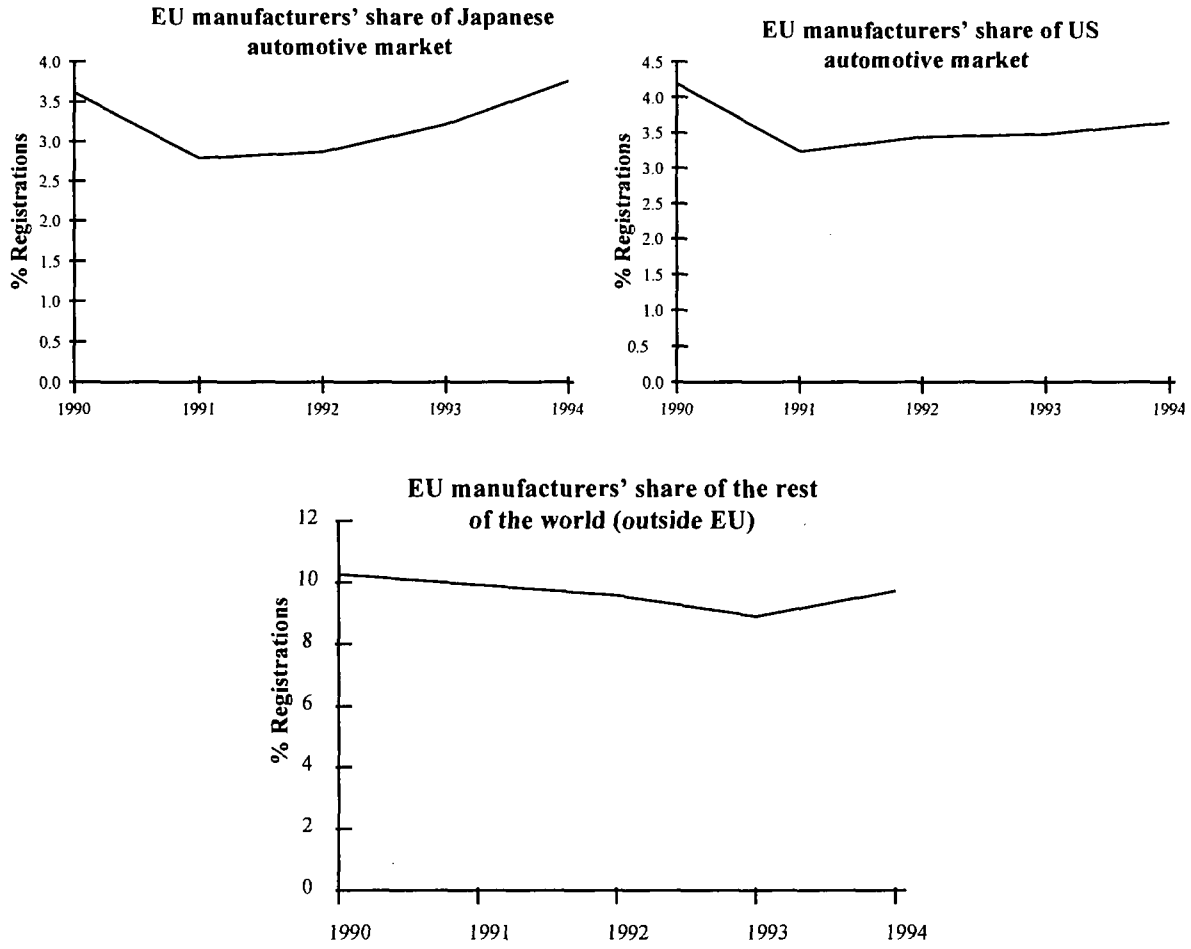
7.1.2. Other factors

There are a number of other factors which need to be considered. The first of these is that there have been a number of moves by the EU-owned manufacturers to adopt a more global strategy in recent years. This includes the adoption of new working methods, development of plant in regions other than Western Europe and the development of more European and global cars with a wider appeal. The relative market conditions and exchange rates in other markets compared to the EU Member States will also play a part in determining the level of trade with these other states. Recession in other markets is likely to make national producers more competitive as they try to hold on to their traditional market share. Exchange rate fluctuations can make imported products less competitively priced. Barriers to trade are also likely to impact on the perceived success of market entry strategies by EU-owned manufacturers. It also takes some time for manufacturers to develop these strategies given that new production or plant may be required, so it may be too early to tell whether the single market has had an impact on the global competitiveness of the EU-owned automotive manufacturers. In any consideration of world trade, costs of transport and shipping are likely to have an impact.

7.1.3. Quantitative analysis

Figure 7.1 shows the EU-owned manufacturers' share of the US market, the Japanese market and the rest of the world between 1990 and 1994. The USA and Japan were chosen for particular examination because they are the two largest automotive producing countries in the world, producing extremely competitive products.

Figure 7.1. EU manufacturers' share of the Japanese, US and world markets, 1990–93



Source: SMMT.

Figure 7.1 shows that:

(a) The share held by the EU-owned manufacturers in both of these markets is extremely low.

(b) Relative market conditions (as indicated by the dip in share in 1990 for both markets) appear to play an important part in determining the level of market share held by the EU-owned manufacturers.

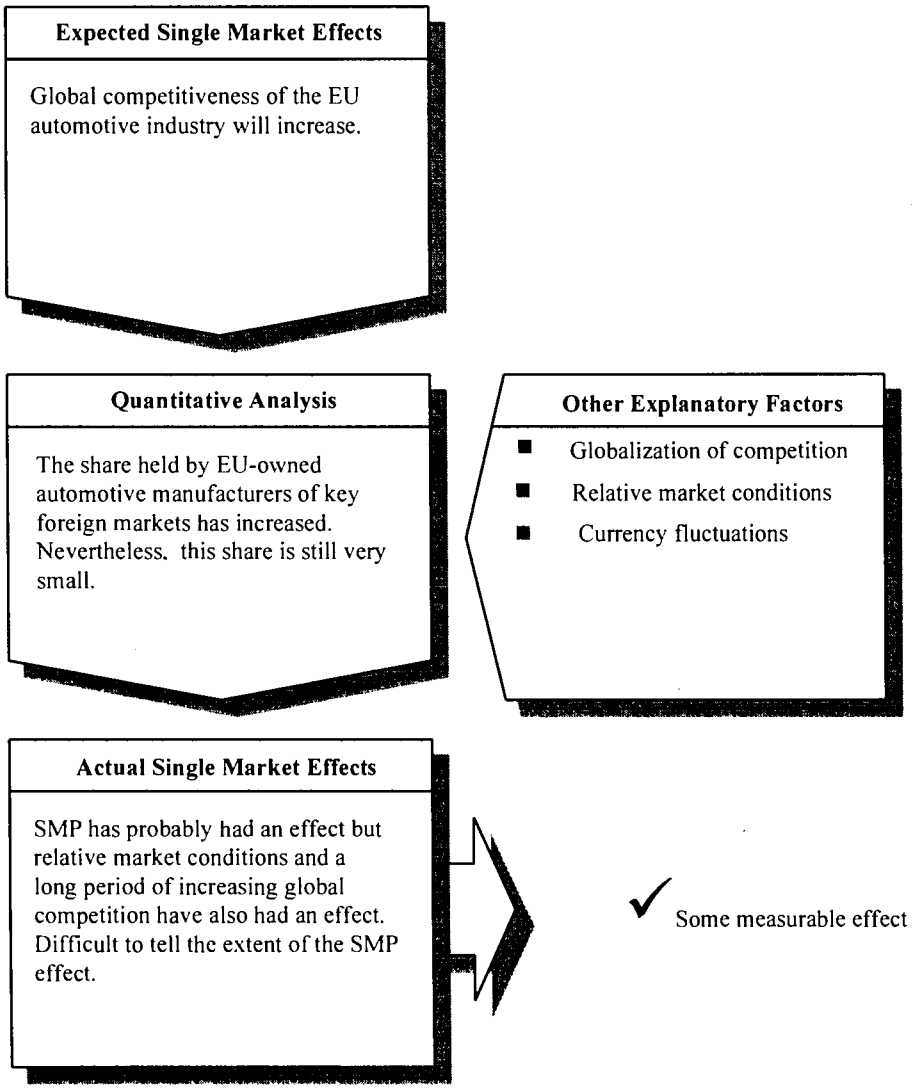
(c) Generally, for the US and Japanese markets, the trend in share in recent years is upward, but the emergence from recession may be an important factor until the last year of the period. The continuation of the upward trend in 1994 suggests that the single market programme may have had an effect.

(d) For the rest of the world, the EU-owned automotive manufacturers' share has declined. This is despite the fact that the volume of EU-indigenous production to the rest of the world has actually increased.

7.1.4. Actual impact

The single market programme does appear to have had an effect. Assessing the extent of this effect is difficult given that globalization of the market for automotive vehicles has been increasing for some time. Relative market conditions also appear to have affected our analysis, making it even more difficult to draw any firm conclusions regarding the impact of the single market programme.

Figure 7.2. Summary diagram 16: Hypothesis 16



8. The impact on business strategy

8.1. Introduction

This chapter deals with the effects of the single market on corporate strategy. In addition to discussions with manufacturers, trade bodies, and academic researchers through our interview programme, we have reviewed press articles and journals to determine the various strategies put in place. This chapter is broken into three sections:

(a) key factors determining strategy;
(b) effects of the single market programme on corporate strategy, i.e. the way in which the whole firm structures itself in carrying out its business;
(c) effects of the single market programme on business process strategy, i.e. the strategy of the different functional departments.

It is clearly difficult to summarize corporate strategies for an entire industry, where each company is positioned differently, adopts varying strategic approaches, attacks its competitors and serves its market in different ways. Nevertheless, there are a number of clear trends which can be identified.

8.2. What are the key factors which determine strategy in the industry?

We consider that there are a number of common factors which have affected motor vehicle manufacturers' corporate strategies:

(a) increasing demand for value for money in terms of the quality and price of vehicles purchased by consumers;
(b) increasing competition from new entrants, particularly from Korea and Japan;
(c) the location and nature of demand in different geographic markets, particularly in Asia and Eastern Europe;
(d) increasing degrees of regulation, especially for environmental and safety considerations;
(e) technological developments in production such as integrated transfer systems and water-based paints.

8.3. The effects of the single market programme on corporate strategy

Whilst it is very difficult to summarize the corporate strategies for an entire industry, we suggest that strategies within the sector have three common characteristics:

(a) a tendency to focus on particular segments of the market;
(b) increasing investment in new production locations;
(c) a desire by the companies to form strategic alliances.

8.3.1. Increasing brand and market focus

Automotive companies are increasingly focusing particular brands on selected market segments. Throughout our analysis, we have stressed how globalization is a key driver and inevitably this means that consumers are becoming more brand mobile and so less likely to purchase vehicles from their traditional national supplier(s). For these reasons, strong branding is becoming increasingly important, so that consumers can easily recognize the attributes and

characteristics of particular vehicles produced by manufacturers from whom they may not have made any previous purchase. Moreover, manufacturers are increasingly moving towards multiple brands as the market requires more differentiated products in each segment. Whilst this is not in any way a novel concept for the motor vehicle industry (for example, General Motors and the predecessors to Rover have used brand families for decades), the driver for economies of scale in design is reinforcing this trend. The economies are sometimes being achieved by acquisition, particularly in the small volume/high value sector (e.g. BMW's take-over of Rover, Ford's takeover of Jaguar) but more often by alliances and joint ventures, which we discuss further below.

Brand stretch across an entire range is perhaps becoming more difficult. Examples of the focus sought by the vehicle manufacturers include the following:

(a) Renault is focusing on small cars in northern Europe.
(b) Fiat is developing a series of world cars which will be targeted at developing countries.
(c) Volvo is keen to make its brand 'sportier', but wishes to retain its niche position for producing safe and high value cars.
(d) For a long time, BMW and Mercedes have focused on the high value end of the market, but they are also attempting to use the brand to move to higher volume, but still focused markets.
(e) Even manufacturers with the broadest European range (such as Ford and GM) are keen to expand through acquisitions into more differentiated brands. Ford's takeover of Jaguar and GM's alliance with Saab can be seen in this light. These takeovers result in no change to the brand of the acquired company, but have clear benefits in the sharing of technology, RD&D, suppliers, and production facilities.
(f) Renault is retaining an American truck brand name (Mack) to develop its market in North America.

8.3.2. Investment in low cost regions

The second trend which can be observed is investment in plants located in lower cost areas. We discussed this in some detail in Section 5.5. For example, GM has set up plants in the former East Germany, Hungary and Poland; VAG has invested in Skoda; and Mercedes has set up joint ventures in Russia. As we mentioned in Section 5.5, European policies have facilitated this development. Companies are not only investing in these low cost areas but increasingly selling products to them. For example, Fiat is targeting specific models for emerging markets. Brazil (from April 1996) and then Poland will be the hub of the 'Palio' production. Production will be extended to Brazil, Argentina, Venezuela, Mexico, Morocco and South Africa. As a consequence of the 'Palio', Fiat expects its sales to be equally split between Italy, the rest of Europe and the rest of the world.

8.3.3. The formation of strategic alliances

Corporate strategies in a number of firms have been directed towards developing strategic links with other firms in the sector. These take the form of:

(a) Joint equity ventures to produce cars, commercial vehicles or important components such as engines and gearboxes. For example, Renault and PSA between them have formed four joint ventures.

(b) Agreements to produce vehicles and components for other assemblers. For example, Volvo makes pressed components for Saab, and engines, pressed parts and transmissions for Renault.
(c) Technology agreements between the largest car assemblers. For example, Honda and Rover have several licensing agreements and BMW and Fiat co-operate on car recycling.

In Figure 8.1, we outline the key agreements which have been developed. Appendix M provides more detail and covers each company in turn.

We consider that these alliances were set up for a variety of reasons including:

(a) a desire by companies to reduce their costs of production through:
  (i) moving production to countries with lower labour costs (see Section 6.5),
  (ii) moving production to other countries to spread the risk of currency fluctuations,
  (iii) taking advantage of economies of scale in the production of parts or vehicles;
(b) a desire to collaborate in technology. For example, Honda's licensing deal with Rover in the UK was seen to have benefited greatly the quality of the products produced by Rover;
(c) risk sharing for the development of new product types, e.g. MPVs/4x4s.

Co-operation between the producers was uncommon before the mid-1970s. The exception was an arrangement between Renault and Peugeot for the joint manufacture of engines and transmissions. Strategic alliances grew rapidly in the 1980s and more recently co-operation has been prevalent in developing multi-purpose and off-road vehicles. For example:

(a) Isuzu and GM are producing a 4x4;
(b) Nissan and Ford are producing an MPV;
(c) VW and Ford are producing an MPV.

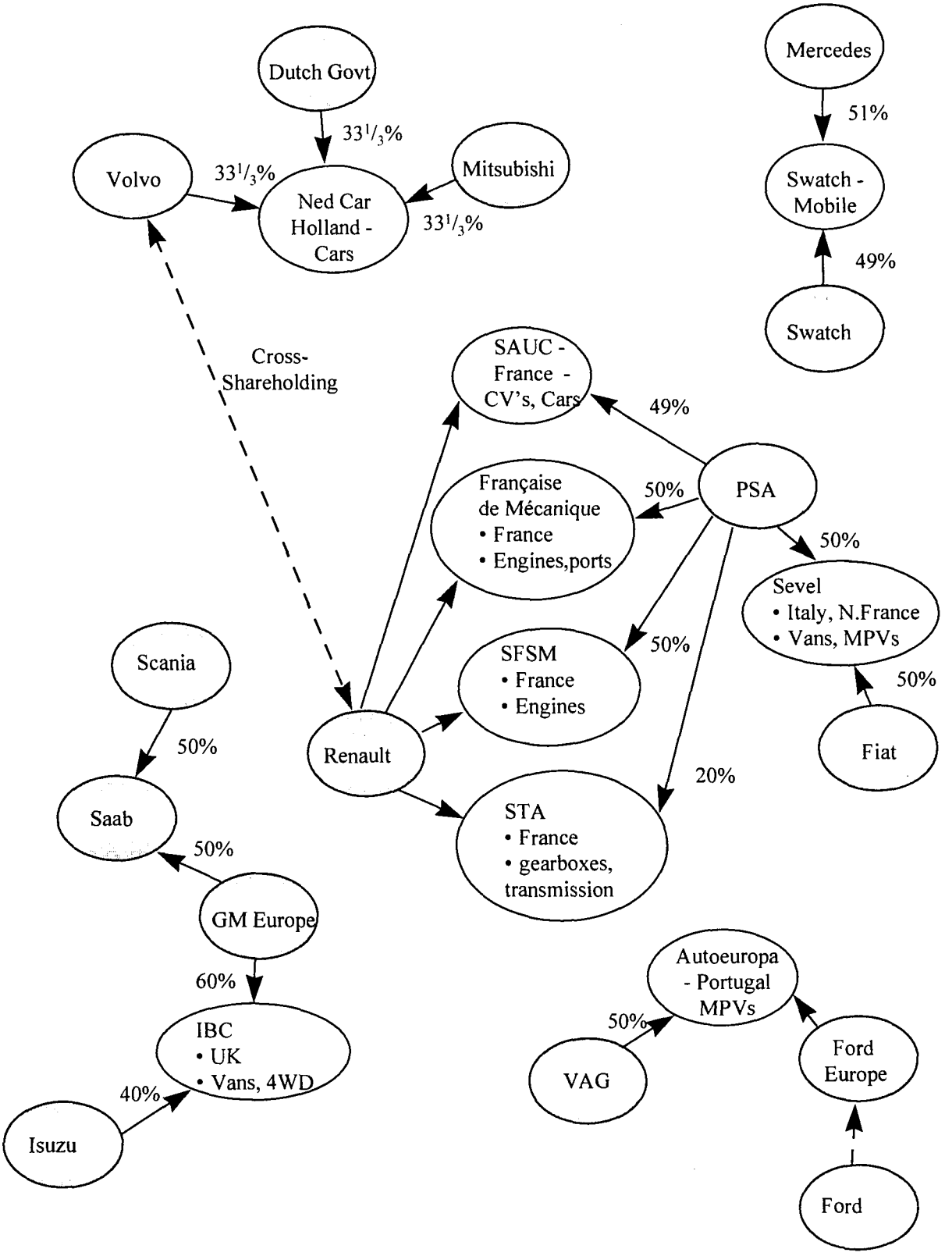
Whilst the single market has fostered a general culture which encourages alliances and restructuring among European manufacturers, it is difficult to associate these changes with any one particular measure.

8.4. Implications of the single market programme on business process strategy

We have considered the effects of the single market programme on business strategy by focusing on different business functions which were outlined in our industry analytical model:

(a) marketing,
(b) production,
(c) purchasing,
(d) research, design and development (RD&D).

Figure 8.1. Significant equity ventures and cross-shareholdings in the EU-based automotive industry



8.4.1. Marketing

In terms of marketing, the passenger car market is commonly broken down into a number of sub-sectors. Table 8.1 provides an overview of sales within each of these over time.

Table 8.1. The segmentation of the new car market in Western Europe

Sub-sector	1989 % market share (units)	1991 % market share (units)	1994 % market share (units)
Small	31.1	31.7	31.2
Lower-medium	31.7	31.3	32.5
Upper-medium	23.1	21.7	22.1
Large/luxury	9.1	8.7	6.8
Coupes/roadsters	1.1	2.0	2.2
MPVs	0.5	0.7	1.4
Off-road	1.5	1.6	2.1
Van-derived	0.9	1.3	1.0
Others	0.8	1.0	0.6
Total	100	100	100

Source: EIU.

Note: Numbers do not add up to 100 because of rounding.

The table shows that there has been a shift towards 'people carriers' (MPVs) and off-road vehicles. Renault told us during our case study programme that over the last ten years there has been more commonality among the different producers' products. For example, there are fewer specific concepts, such as the 2CV or the R4. However, there has been an increase in the number of models in each model class. In the 1950s, there was usually only one model by class. Now, there are usually four models for each class of car (coupe, hatchback, estate and saloon). This has resulted in a decrease in share for each model as they become increasingly differentiated.

For these reasons, Renault considers that the increase in models and variants is more a reflection of the long-term increase of global competition in the automotive industry than the single market programme increasing the competition and variety available to the consumer. Global competitive increases are more to do with the Common Market, a natural progression to develop sales in new markets and overcapacity world-wide. This, in turn has led to a more sophisticated consumer who demands more from the automotive manufacturers. This has also led to an increase in competition.

With respect to distribution, the key issues are:

(a) to reduce the cost of distribution;
(b) to improve the customer-order delivery time;
(c) to improve responsiveness to customer requirements;
(d) to retain service, repair and parts sales;
(e) to provide a pan-European brand experience.

That is, in the short to medium term there will be an overall trend towards greater uniformity between individual national distribution systems. In the longer term, a more sophisticated and subtle approach to structuring distribution systems within Europe may develop, in which national boundaries are no longer the primary determinant of marketing areas.

The strategy pursued by Daewoo in the UK has attracted attention. The Korean company has commenced building a network of about 30 manufacturer-owned car sales points (Daewoo Vision 2000) which feature single price, 'no-haggle and no-pressure' approaches to sales. Servicing is to be carried out by a third party, Halfords, in their national network of 'fastfit' centres. Thus far, the strategy has been a success, with sales in the first nine months of operation gaining over 1% of the market – the most rapid gain in market share ever recorded for a new entrant in the UK. We understand that to facilitate this growth, the company is investing ECU 3,000 on marketing for each car sold.

The strategy of vehicle assemblers with production facilities in Europe is, where possible, to leverage this advantage in distribution and marketing by offering greater speed of response and greater sensitivity to customer demands. This entails establishing robust EDI systems to link dealerships with factory output, having the necessary flexibility in production, and where possible removing stock from dealerships to larger regional or national stock-holding points.

Some companies, especially those producing high value vehicles, such as Volvo, Saab and BMW, have sought to differentiate themselves through the quality of their service and repair work in the distribution network.

8.4.2. Production

In terms of vehicle production, there have been a number of important changes:

(a) there has been a trend for new investments to be set up in peripheral regions;
(b) the industry is increasingly using lean manufacturing techniques;
(c) there has been an increasing use of new technological processes in producing vehicles.

Companies are investing in peripheral regions of Europe in order to benefit from both lower costs (in aggregate, allowing for subsidies) and the ability to set up new labour agreements and exploit large new sites for new production layouts and space for JIT suppliers, etc. We covered the investments made by vehicle producers in Chapter 6. Of the 24 investments covered between 1985 and 1996, 12 were in Eastern Europe (including former East Germany). Volume manufacturers argue that fundamental changes in production are easier and less costly to implement in new production facilities than trying to change all of their existing facilities. There is also a trend for the Japanese companies to expand their production outside their domestic market. For example, Toyota has plans to increase the numbers of cars it manufactures outside Japan from 45% in 1994 to 55% in 1996, and to 65% in 1998.

Manufacturers have been using increasingly lean production techniques. For example, Fiat's new plant at Melfi in the south of Italy, which produces the Punto, uses its 'integrated factory' concept. This focuses on lean production, using Japanese techniques such as team working, multi-skilling, flexibility, continuous improvement and the exploitation of plant-level economies of scale. These changes have helped to reduce the number of hours it takes to make a vehicle. These improvements can be illustrated by comparing the performances of the new Melfi (assembly) and Pratola Serra (engines) plants with the older ones: Cassino and Termoli.

In the new plants there has been a reduction in time based manufacturing, measured by the time required by the car to go from the start to the end of the line. This indicator is lower at Melfi compared to Cassino, by 40% in body welding, by 30% in paint, and 8% in final assembly (i.e. the improvements are largest in the highly automated areas). The total time devoted to these operations is 27 hours at Melfi and 38 hours at Cassino. In addition, the number of parts stored along these lines has decreased by 32% (as a result of more proximate suppliers). Smaller manufacturers, such as Volvo, see flexibility in manufacturing as key to their competitive survival. This flexibility is necessary so they can compete with the low cost, high volume producers, such as Ford.

There are still large variations in the efficiency of the manufacturing process for different geographic regions and manufacturers. Toyota can currently produce a car in 12 man-hours compared to 16–20 for Honda, Nissan and Ford. Boston Consulting Group concluded in their study for the European Commission that the productivity of the leading Japanese car assembly companies was 30% higher than in Europe. Such benchmarking analyses need strong 'health warnings'; both definition of the beginning and end of production and method of measurement vary from company to company, making inter-firm comparison on this basis very difficult.

Companies have increasingly been using new technological processes, in order to improve quality and to reduce costs. For example, engines used to be made with general purpose machine tools, but are now made with flexible numerically computer controlled and robotic machinery or with dedicated machine tools. In-cycle quality assurance takes place using programmable metrological probes which test tolerances and reject parts immediately if they do not meet quality criteria. The manufacture of body panels has also benefited from manual tandem technological changes. Manufacture then moved on to semi-automated or automated tandem press lines (typically six to eight lines of eight presses). Further innovations included tri-axis transfer presses. The body in white assembly (i.e. welding) has also undergone some important changes. First, there were simple manual jigs and manual welders. This, then, moved on to programmable robotic body welding. The latest technology being employed is an Intelligent Body Framing System.

The conclusion from this is that the single market programme may support such manufacturing strategies, but is of minor importance compared with other activities.

8.4.3. Purchasing

The power of vehicle assemblers in the supply chain should not be underestimated. While they have ceded some ground in terms of extended purchasing contracts and greater technological dependency on their suppliers, their control over the relationship is such that they are able to insist upon sweeping cost reductions. Supplier facilities located alongside assembly plants may be dedicated to serving that plant alone. For example, Fiat explained to us how 16 suppliers are located within their Melfi plant. In these circumstances, while components suppliers may have contracts for the lifetime of production of a particular model, there may not be any contract security beyond that point. As a result, close proximity investments often involve leased premises and low capital investment costs.

Vehicle assemblers are also reducing the number of suppliers they deal with. For example, Volvo is reducing its supply chain by a net amount of 20 suppliers per annum. They have identified 160 product areas, and the intention is to have one supplier per components area per

model or platform. Our case study with Fiat showed that it started its selection and empowerment of suppliers in 1991, in view of the launch of the Punto. This 'crescita guidata' (assisted growth) was based on the collaboration between Fiat and a set of selected suppliers to cut costs by 15% through standardization, quality control, warehousing and reducing the weight of components. Fiat told us that the reduction in the number of suppliers has been significant, from 1,200 in 1987 to 380 today. Renault dealt with 1,163 suppliers in 1989 and by 1995 this had been reduced by 28% to 843. Seventy per cent of the cost of the vehicle is now produced by components suppliers, compared with 20% only 20 years ago.

The greater demands placed upon suppliers to undertake 'systems' development and a greater share of the R&D input into the product demands that suppliers achieve scale and, ideally, synergies across their businesses. For example, Volvo expects to save 30–40% in RD&D costs through co-development with suppliers. Fiat has seen the proportion of design carried out by suppliers grow markedly from 30% for the Uno in 1983, to 45% for the Punto in 1994 and to 55% for the Bravo/Brava in 1995. Moreover, a 'system' is not a fixed concept, but is continuously redefined in the face of changes in product technology and sourcing strategy. Thus, components suppliers face great challenges in creating an optimum business structure and defining a specific place within the supply chain that is appropriate for their capabilities.

The conclusion from this is that for both volume manufacturers and suppliers, the single market programme does not conflict with the strategy for purchasing.

Section 6.6 covered our analysis of the degree to which components suppliers were becoming international.

8.4.4. Research, design and development

RD&D organization and process changes are made in response to one central problem: the need to minimize the cost and time taken to create a coherent, production-ready design in the face of growing product complexity and market fragmentation. A key element of RD&D organization and process is the link to manufacturing strategy in what are often global companies seeking to address a range of distinct markets. Typically about 3–5% of sales is devoted to RD&D, but only a portion of this is actually new vehicle design and development. At least half of the resources go towards facilities improvement. Large sums may be spent on technologies not immediately used (especially in the area of drivetrains where manufacturers adopt a range of approaches on a 'just in case' basis). Volvo have a strong commitment to the social and environmental aspects of their products, and so environmental issues play an important part in their RD&D. It has developed a series of environmental concept vehicles, including the use of gas turbine/electric motors.

We can distinguish four basic models of RD&D organization in the automotive industry:

(a) centralized,
(b) bi-polar,
(c) networked hierarchy,
(d) multi-nodal networks.

Centralized model

In a centralized organizational structure all the major elements of the RD&D process are located within one main centre, which may in fact consist of one main building or may be a collection of proximate buildings. Such centres would also contain test facilities, such as wind chambers and test tracks. A contemporary example of this approach is Renault, who are constructing a vast 'Technocentre' outside Paris. This Technocentre is seen as 'an architectural interpretation of a new way of working' by Renault based on a simple basic idea: '...to improve and accelerate the process of vehicle development by bringing together on a single site all the men and women who are involved in the design, engineering and manufacturing process activities'.

The Renault Technocentre will house approximately 12,000 of its own staff, and about 1,000 staff seconded from suppliers. It will enable Renault to adopt a new form of RD&D process by reducing the costs of co-ordination and integration. RD&D processes are discussed separately below.

Bi-polar model

The bi-polar structure is common in the automotive sector, consisting of two more or less equal centres for RD&D activities which may or may not undertake distinctly separate activities. Typically, this type of structure emerges following the acquisition or restructuring of previously separate entities. Typical examples may include Ford in Europe (prior to the Ford 2000 changes), BMW-Rover, and PSA (with Peugeot and Citroën activities).

The bi-polar structure can be seen as sub-optimal in that there may be a degree of duplication of activities. Both sites are essentially equal in standing and resources. Where activities are apportioned to each site, there remain costs of co-ordination and integration, especially where manufacturing responsibilities are split.

Networked hierarchy model

The networked hierarchy is the preferred structure for globalized Japanese automotive companies. In brief, it entails the centralized location of core activities in basic research and vehicle design. Secondary hubs in the network may perform a range of 'localization' roles including styling; local engineering requirements (e.g. changes to suspensions); materials conformance; standards conformance; and supplier evaluation to support local manufacturing activities.

The central hub in the network is roughly equivalent to the organizational structure noted above, and is based in the 'domestic' market of the manufacturer. Secondary centres may feed into the design process at several stages. For example, many Japanese companies maintain styling centres in California, and these may feed into the product concept stage. Engineering centres of the type employed by the Japanese in Europe may undertake a range of roles later on in the development process including 'local' engineering changes to meet specific market or regulatory conditions, or supplier quality and performance monitoring including materials standards conformance testing. Key strategic and design decisions are taken at the centre.

Multi-nodal networks model

This is a further stage in the evolution of RD&D structures in which secondary hubs are effectively upgraded towards a more equal status with the central hub. A number of automotive assemblers are moving in this direction including Ford (whose global network includes Mazda in Japan and Kia in Korea), Honda, Nissan and GM. In this type of structure, each hub is capable of full product development, from conception and styling through to production engineering. This in turn is linked to a manufacturing strategy which entails product specialization for some facilities. Thus, for example, the Honda Accord Aerodeck was designed in the USA, is built in the USA, and exported to both Japan and Europe. Under the Ford 2000 programme, Europe will be the primary location for small cars RD&D, while the USA will be the location for medium and large car work. Nissan told us that there was no 'mother development' of the Terrano II/Maverick or the Vanette Cargo in Japan. All the development was carried out in Europe, although it did use common components from other models such as engines and gearboxes.

9. Case study summaries

This chapter summarizes the findings of our detailed case studies with a selection of automotive manufacturers. More extensive findings from the case studies are set out in Appendices Q to U, where each of the manufacturers is examined in more detail.

9.1. Nissan

Nissan was chosen as a case study for a number of reasons: it first entered the European market in the 1960s and during the 1980s made major investments in manufacturing facilities in the region providing an interesting, non-EU perspective on market entry and plant location; it is a global player, so its attitude to the EU can be compared with its strategies towards North America; it pioneered the introduction of a number of new practices to the European automobile industry, such as lean manufacturing techniques, simultaneous engineering and common terms and conditions.

Products and production. Nissan produces passenger cars in high volume with a good presence throughout the small to large segments. In total, there are 26 models (passenger cars, light commercial vehicles and trucks) for the European market from over 40 model-types available globally. In 1991, Nissan was producing nearly 200,000 units in Europe, by 1995 production in Europe was nearly 340,000. Throughout this period two-thirds of production was from the UK, with the remainder in Spain. They foresee a trend of rationalizing their number of platforms and restricting their range in the future.

The single market and access. Nissan offers its products to the whole of Europe. It sells six main models into the European market, compared with a total of around 20 major models across the globe. Nissan employs a pan-European marketing campaign for the launch of a new product, often using a common advertising theme. Nissan said that at the time of market entry, the establishment of an effective sales network was one of the more difficult problems, particularly given the block exemption system. Nevertheless, Nissan thought that it was normal for a new entrant to make more of an effort than indigenous players. Nissan added that the appreciation of the Yen had not affected its strategy towards Europe and the development of production facilities.

Production. Nissan intends to commonize its engines, drives and chassis on a global basis, but to retain different production structures within each region. Nissan is also attempting to halve the number of platforms it has from the current 26, in order to achieve economies of scale at the global level. Productivity targets have been 10% increases per annum in the UK. They have achieved this in 1994, 1995 and 1996. Of the 10%, 7–7.5% is from process improvements, the rest is through design changes. Future targets are 10%, 8% and 7% over the next three years.

Employment. Nissan indulges in some transfer of employees across the EU. This is more to do with the development of the skills of the employees rather than the single market programme.

Manufacturing plants, location and size. Nissan has not relocated as such, but has developed new European sites to manufacture and distribute its vehicles. Nissan has two manufacturing bases in Europe, one in the UK and the other in Spain. Nissan Motor Manufacturing (UK) Ltd is Nissan's European passenger car production plant, making the Micra and Primera.

Established in 1985, it was the largest exporter of passenger vehicles from the UK in 1993. By 1995 it had produced 215,000 vehicles. The Spanish operations produce 4x4, multi-purpose, light commercial vehicles, commercial and industrial vehicles and forklifts. Nissan entered the market by buying a Ford plant, becoming majority shareholder in 1982. In 1995, it produced 122,000 vehicles, two-thirds of which are exported to other European markets.

Purchasing. In 1994, Nissan had 198 suppliers for the UK plant and 241 for the Spanish plant. Thirty-nine suppliers are common to the UK and Spanish plants, and this number is increasing. Components expenditure in Europe has increased from around UK£ 50 million in 1986 to UK£ 200 million in 1995. The number of European components suppliers has increased from zero in 1986 to around 750 in 1995. When Nissan entered the EU market it used indigenous sources of supply because its perceived customer requirements were different for performance requirements from subsystems (e.g. suspension systems, braking systems, etc.) in the EU compared to Japan. It considered the best way to meet these requirements was to use indigenous components supply (in contrast to previous policy in North America). Since entry, Nissan has actively encouraged the components suppliers to adopt new techniques and to improve efficiency.

RD&D. Nissan's European Technology Centres (NETCs) operate from bases in the UK and Belgium and represent a total investment of ECU 78 million. Our calculations suggest that Nissan makes direct savings of approximately ECU 1 million through the single market programme's whole vehicle type approval. Products for both Japan and Europe are increasingly likely to have their design, development and production shared between these two regions, rather than Europe purely 'localizing' design. Design and development has been increasingly delegated down to the suppliers. However, this originated from Nissan's own policy on relations with suppliers (i.e. simultaneous engineering) and not as a result of the single market programme.

Business strategy. Nissan's strategy over the past two to three years has been the global 'commonization' or sharing of platform and parts/components across model lines in order to reduce both production costs and costs to the after-sales market. One example of this 'commonization' strategy is that the new Primera built in the UK shares a common platform with the Japanese Bluebird. Nissan shares the design and production of the Terrano II with the Ford Maverick. Both are made at Nissan's Spanish site. Within production at Nissan's plant in Sunderland, all staff share the same terms of employment. Eight major suppliers who manufacture components simultaneously have plants alongside the Sunderland site.

9.2. Fiat

Fiat was chosen as a case study because: the company is one of the major automotive manufacturers in the EU; the Italian automotive market has been relatively closed in the past with the strong brand of Fiat dominating entrants; Fiat has invested heavily in Poland and has a growing presence in new markets around the world; and has a strong commercial vehicle presence through Iveco.

Products and production. Since its inception, Fiat has concentrated in its home market and specializes in the economy car segment. However, the acquisition of Alfa Romeo strengthened its presence in the luxury car segment. Currently, Fiat sells its products under six different makes: Fiat, Lancia, Alfa Romeo, Innocenti, Ferrari and Maserati. Iveco produces the full

range of commercial vehicles, but specializes in light and medium vehicles. Fiat Auto production in 1994 was 2,107,800 units and a further 247,600 cars were produced by partners and licensees.

The single market programme and access. Fiat performed badly between 1990 and 1993, mainly because of unsatisfactory products and an inefficient distribution system. In 1993, Fiat launched a revamped product range and overhauled the distribution system by reducing the number of franchised distributors and the development of a more systematic performance evaluation system. The new model range is focused on the mid-size segment because of the stability and volumes of sales available from this segment in Europe. Fiat views the devaluation of the Lira as beneficial to profits rather than to sales. Fiat believes that differences in tax systems, peculiarities in the administrative regimes, and some policies designed to protect local markets are restricting a truly unified market.

Production. The reorganization of Fiat carried out in the early 1990s is based on the Integrated Factory project, which adopts the 'Toyota' framework. This has taken into account the shortcomings experienced in the previous technologically driven organizational innovations and the resultant rigidities. Fiat believes that the improved productivity performances are the result of growing global competition in the sector, which could have been caused only indirectly by the single market programme. Fiat believes that some regulations regarding the environment have generated a considerable increase in costs.

Employment. Between 1990 and 1994, employment at Fiat fell by 10%. In Italy, the fall was 30% whereas extra-European employment has increased. In Fiat's new plants, new contractual conditions have been implemented to gain greater flexibility in production organization. Fiat believes that the single market programme was not responsible for these changes, rather it is as a result of growing competition and changing labour relations in Italy. Furthermore, Fiat considers that there is no evidence of an increase in cross-border recruitment.

Manufacturing plants, location and size. With the exception of the internationalization initiatives on an extra-European basis, Fiat Auto has historically concentrated its activities in Italy. However, production has shifted from the north of Italy to the south with the opening of the Melfi (capacity of 450,000 cars per annum) and Pratola Serra plants. These greenfield plants were selected over EU alternatives because of logistical considerations such as proximity to other Fiat operations and investment grants, although similar grants could have been obtained for other sites. The new Polish plant was implemented to take advantage both of developing Central and Eastern European markets, and provide opportunities to export to Western countries from a lower cost base.

Purchasing. The main changes in this area are through a reduction in the number of suppliers used, an increased empowerment of components suppliers in product concept and design, the implementation of 'assisted growth' and the diffusion of JIT supply. This has led to suppliers being closer to the manufacturing plants, restricting the internationalization of supply and cross-border sourcing. Fiat believes that the single market has had only a limited effect on purchasing practices but has played a part in the increased concentration of the components industry.

RD&D. Fiat Auto RD&D is run in Italy with the main design unit, the Research Centre of Orbassano (Torino), employing 781 people. Fiat considers that the implementation of

companion and whole vehicle type approval has not generated any savings because differences still remain in the administration of these procedures, particularly registration.

Business strategy. Fiat views the EU as a domestic market with their primary focus increasingly on the emerging markets in South America and Eastern Europe. Nevertheless, the strengthening of the position on the European market is an essential objective of Fiat's strategy, to be secured by gaining a bigger market share in the medium car segment. Fiat's main objectives are to reduce the break-even point of its activities, increase efficiency and the new emerging markets.

9.3. Renault

Renault was chosen as a case study because of its significant presence in the EU: it is the third largest producer in the EU after Ford and GM and will provide a useful perspective from the point of view of a company which has been selling cars throughout Europe for a long time.

Products and production. Renault produces passenger cars, ranging from the Twingo to the Espace, and industrial vehicles (through Renault V.I.) through two branches of its business – Branche Europe and Mack trucks. In 1985, total passenger car production was 1.6 million vehicles and rose steadily to 1.93 million in 1989. Since then, production has fluctuated at around 1.8 million per annum. For commercial vehicles, Renault V.I. produced 64,415 vehicles in 1994. Renault has three major markets – Western Europe, North America and the Asia Pacific. However, Renault has a presence in South America, the former Soviet states, China, Central Europe and Africa.

The single market programme and access. Renault did not wait until the implementation of the single market programme before it treated Europe as a common single market. Renault established a Common Market division in 1961 and views the single market programme as a formalization of the Common Market. Renault considers the increase in models and variants available to customers in the EU more as a result of the increasing globalization of competition in the automotive industry than the single market programme. Renault does not consider that pan-European marketing is possible even though they do produce European cars. Pan-European marketing is difficult because of remaining differences in consumer needs and tastes across the EU.

Production. Renault considers that the single market programme has not been the principal driver of improvements in production costs and productivity. Any recent changes in productivity are because of the globalization of competition in the automotive industry. The increased competition has increased productivity and Renault would have made these improvements whether the single market programme was implemented or not. Renault considers that, at most, the single market programme was a contributory factor to their improvements in productivity.

Employment. There has been a significant decline in Renault's employment – as a direct result of productivity improvements made over recent years. Renault regards the role of the single market in this fall in employment as minimal at most. Mobility of Renault's workforce is low because of country-specific social laws, pensions, taxes and salaries, all perceived by Renault as barriers to mobility.

Manufacturing plants, location and size. Renault tends to have relatively small plants in comparison with the US companies. This is because Renault attaches significant importance to flexibility in production and balances this with scale economies. Renault's plants have been traditionally located in France and southern Europe, where demand used to be based. However, as demand for Renault's products has shifted to the north of Europe, so too have their plant locations. Renault does not consider that the single market has played a part in the location of their plants, but that their long-term strategy of developing sales in the north of Europe is more important.

Purchasing. In 1989, Renault dealt with 1,163 components suppliers, by 1995 this had fallen by 27.5% to 843. This reduction is more a reflection of the use of 'systems' suppliers, those suppliers that take on a components system for manufacture and then pass that on to the automotive manufacturer, than as a result of the single market programme. Renault consider that the location of suppliers used has not significantly changed. This is a reflection of the fact that Renault has developed long-term contracts with suppliers for development and production of the components and systems.

RD&D. Renault considers that the single market programme allows RD&D to be located in one place. Before the single market programme was implemented, Renault had been pursuing a policy of centralizing RD&D in France through the closure of some small RD&D operations in Spain. Renault considers that the single market programme has had a significant positive effect through whole vehicle type approval. However, Renault considers that the costs imposed through over-regulation have outweighed the cost benefits of whole vehicle type approval.

Business strategy. Renault's prime strategy is the development of a demand base in northern Europe, away from its traditional demand base of southern Europe as this area becomes increasingly competitive. Renault considers that the single market programme has had an indirect effect on its business through the benefits it has brought to new entrants into the EU market, particularly the Japanese and Korean firms. In response to this increased competition and the steadily increasing globalization of competition, Volvo and Renault had attempted to merge. However, political differences, mainly the state ownership of Renault, saw the merger collapse.

9.4. Volvo

Volvo was selected as a case study because the company: combines commercial vehicle and passenger car production; has a small domestic market and a long experience of internationalization; is based in Sweden which is a new Member State in the EU; has significant and long-standing manufacturing investments in the EU; derives a significant proportion of total sales within the EU; and has been a key actor in alliance activity both successfully (with Mitsubishi) and unsuccessfully (Renault).

Products and production. Volvo produces passenger cars in medium volume, with a stronger presence in the larger segments, and is thus illustrative of other European producers such as Mercedes and BMW. In the commercial vehicle sector, Volvo is considered a volume producer. In both, Volvo has major manufacturing operations in the EU.

The single market and access. In both cars and, especially, commercial vehicles Volvo has long relied on markets outside Sweden – typically the USA, Germany, the Netherlands and the

UK. The single market programme has not affected this long-term position, but may be said to have supported it. Volvo considered other factors as important in shaping sales outside the domestic market but within the EU, notably Member State tax regimes, differences in Member State economic performance, and exchange rate movements.

Production. In the 1980s, Volvo experimented in Sweden with working practices in order to reduce absenteeism and other labour problems. More recently, Volvo has adopted a set of working practices which could be generally termed 'lean' production. These changes, and new investment in productive capacity associated with the introduction of the 850 series passenger car, made a large difference to production costs against which the contribution of the single market programme was not discernible.

Employment. Volvo, by virtue of its international production facilities, has long been a significant employer of non-domestic (i.e. non-Swedish) staff. The single market programme has facilitated the process of international recruitment.

Manufacturing plants, location and size. Volvo's largest plant is in Ghent, Belgium whose output in 1994 was 147,000 cars. The Nedcar plant in Born, Netherlands, may, in part at least, be attributable to the desire of Volvo's joint venture partner, Mitsubishi, to have manufacturing operations within the EU. One reason why the Born plant is a workable proposition for both parties is that a single market exists, so that one plant can indeed serve all markets. Volvo has a more international spread of manufacturing operations for commercial vehicles, but again EU locations (UK, Belgium) are important.

Purchasing. As with production, Volvo has adopted a new set of purchasing approaches which have generated significant cost savings on product development, piece prices, and assembly cost. By virtue of the restricted supply base within Sweden, and the long-term manufacturing presence within the EU, Volvo has traditionally sourced a high proportion of components outside Sweden. The single market programme is entirely supportive of the efforts of Volvo to reduce purchasing costs, but the direct cost saving impact is minimal compared with the very large savings generated by new purchasing approaches.

RD&D. Volvo considered that RD&D savings could occur where a reduced number of variants needed to be produced. The largest single contributor to variance was the existence of different Member State tax regimes. The single market programme did reduce some variant cost, and reduced the cost of achieving type approval, but the savings were minor compared with the extra cost of variants noted above, and the savings generated by new collaborative RD&D relationships with suppliers.

Business strategy. The single market programme was seen as essentially supportive of Volvo's corporate strategies, although the company has gone through some significant changes in strategic direction in the recent past following the failure of the merger with Renault. In general terms, the single market programme increased competitive pressure in the EU automotive industry, and this could be expected to drive further consolidation in the industry.

9.5. Daewoo

Daewoo was selected as a case study to represent a recent entrant into European markets, and also to represent the growing automotive industry of South Korea. Daewoo has no volume

production facilities in the EU at present, but has embarked upon a rapid global expansion which includes the acquisition of IAD, a UK company with expertise in vehicle RD&D.

Daewoo has the bulk of its production facilities in South Korea, and has plans to expand capacity from 396,000 cars (1994) to 2,200,000 cars (2000). In the short term, the majority of sales into the EU will come directly from South Korea, though in the medium term, the new plants under construction in Uzbekhistan, Poland, and Romania could become sources of EU imports. At present, parts of the Daewoo car range are derived from previous generation GM products, but by the year 2000 the entire range should be Daewoo's own designs.

The single market programme and access. Daewoo made its initial entry into markets in the EU in 1995, after the single market programme had been introduced. It is likely that the removal of barriers to trade within the EU had helped Daewoo gain market presence. Of more fundamental concern to Daewoo is the overall issue of imports from South Korea to the EU and reciprocal access for EU producers to the South Korean market.

Production costs. Clearly, the single market programme has not had an impact upon production costs or productivity in Daewoo.

Employment. At present, Daewoo is not a large employer within the EU and its presence is so recent that any effect from the single market programme is not yet noticeable. On the other hand, through the purchase of IAD and its general policy of recruiting non-South Korean staff for key RD&D and marketing posts, Daewoo can be said to benefit from the general freedom of movement within the EU.

Manufacturing plants, location and size. As noted above, Daewoo does not at present have volume manufacturing facilities in the EU. In the future it may have, either because of enlargement of the EU to include countries which already have a Daewoo plant, or because Daewoo may decide to build a further new plant within the current EU. In the commercial vehicle sector, Daewoo has further deepened its relationship with Steyr of Austria and has taken a 65% share of four plants. Access to EU markets was probably an important factor in these investments.

Purchasing. There is no information available on Daewoo purchasing activities in the EU, but they may be assumed to be insignificant. On the other hand, with the purchase of IAD, Daewoo is now in a position to develop RD&D links with potential suppliers.

RD&D. As noted above, Daewoo has sought to expand its own RD&D capabilities so that it may become independent from other vehicle manufacturers – most notably through the purchase of IAD. As with other manufacturers in the EU, Daewoo may be expected to benefit from the reduced costs of type approval under the single market programme.

Business strategy. To date, the expansion strategy of Daewoo has resulted in many new plants being built, both large and small, but none has been within the major markets of the EU, North America or Japan. Equally, the market focus has been on Eastern Europe, Asia and Latin America. Prior to 1995, Daewoo was excluded from EU markets under the terms of its licence agreement with GM. The single market programme has been less of an issue for Daewoo; of more concern is the possible application of quotas and tariffs to South Korean imports into the EU.

10. Conclusions and future actions

This chapter provides our assessment of the effects of the single market programme on the motor vehicles sector, and the measures which we believe should be put in place in the future in order to remove the remaining restrictions on trade which impede the development of the sector.

10.1. Impact of the single market

Our views are brought together under each of the hypotheses covered in this report. In the table which follows, we summarize the analysis and results against each of the hypotheses covered in Chapters 5 and 6. The final column shows the extent to which the results are consistent with the expected impact of the single market programme.

Table 10.1. Conclusions for each hypothesis

Hypothesis	Analysis	Consistency with expected impact of SMP
Marketing		
Improved market access	This hypothesis is covered by the more detailed hypotheses below. Overall, this hypothesis is consistent with our results that the single market programme has improved market access.	✓
Intra-EU trade at an aggregate level has increased	Aggregate measurement of intra-EU trade failed to prove this hypothesis. It is likely that the impact of the single market was being outweighed by other factors in some Member States, as discussed below.	--
Number of models and variants will increase	There has been a dramatic increase in the number of variants and models available in France and Germany. Moreover, the share of the top ten models in France has also fallen, also indicating a more fragmented market.	✓
Relative share of national sales as a proportion of total sales will fall	While some manufacturers' national sales as a percentage of total sales declined, other (most notably German-owned manufacturers) shares increased. German reunification is a factor in these results.	✓
Intra-EU trade relative to individual Member State consumption will increase	There were differing results for the countries analysed. Other factors appear to have played a more important role in determining exports and imports rather than the single market programme.	✓
Manufacturers' national market shares will fall	While some manufacturers' share of their national market declined, German-owned manufacturers' national share increased. German reunification is a factor in these results.	✓
Manufacturers' market share will equalize across Member States	From 1992, the variance in price across the Member States for French and German manufacturers declined. Exchange rate volatility was an additional factor affecting our results for Italy.	✓
Competition and market concentration will increase	Concentration increased for the top three and top ten producers. Profitability, as measured by return on capital employed, has fallen.	--
Prices will become less variable across Member States	The variation of prices for certain models had fallen.	--
Pan-European distribution and marketing networks will be developed	Large differences remain in the structure of distribution across the EU Member States.	--

Table 10.1. Conclusions for each hypothesis (continued)

Hypothesis	Analysis	Consistency with expected impact of SMP
Production		
Production costs will be lower	The EU-owned manufacturers were found to have become more globally competitive and average real labour costs have fallen recently.	✓
Productivity will increase	EU producers have made gradual improvements in productivity, although these improvements began well before the single market programme was implemented.	✓
Employment levels will fall as an indirect result of greater competition and competitiveness of EU manufacturers	Employment by EU-owned automotive manufacturers declined by 9% between 1992 and 1994.	--
The structure of investment in the EU will change	The FDI flows analysed indicated that the companies anticipated the likely impact of the single market programme. Some manufacturers' FDI strategy appears to be based on a global rather than a single market programme strategy. Few plants have been closed.	✓
Supply		
Components supply will become more European	Purchases have become more internationalized and suppliers have become more internationalized. These results may also be a reflection of wider policy goals of globalization.	✓
RD&D		
RD&D costs will fall	Whole vehicle type approval harmonization has had a direct impact on the costs of RD&D.	✓✓✓
	Type approval harmonization for some components has had a limited impact, since UNECE standards were already followed.	--
All		
Global competitiveness of the EU-owned automotive industry will increase	Actual volumes of exports to non-EU markets have increased, percentage share held by EU-owned manufacturers has fallen.	✓

Note: We have used a tick system to represent various degrees of consistency:
✓✓✓ indication that the single market programme has had a direct impact;
✓✓ indication that the single market programme has facilitated the results;
✓ indication that the result is to some extent consistent with the expected impact;
-- indication of no impact.

As the table shows, the single market programme has had a positive impact on the automotive sector, particularly in facilitating trade for both vehicles and components, increasing consumer choice in Member States and reducing costs of applying for whole vehicle type approval. In addition, it is clear in a number of cases that there has been a convergence between the behaviour and shares held by the manufacturers and Member States. For example, the 'opening' of more closed markets has resulted in a similar share held by the top ten brands of passenger car across the EU.

However, the effects of the SMP on the other changes occurring in the industry has been limited. This is because:

(a) The automotive industry is mature and was one of the first to see markets in a global perspective. Half a century before the single market programme was conceived,

companies (particularly the US-owned manufacturers) had set up plants in a number of countries and were selling products in each country. The abolition of customs duties within the Common Market significantly affected the development of US-owned manufacturers in Europe over the last 50 years (e.g. Ford integrating European control through setting up Ford of Europe in 1966). Much of this adjustment has already occurred and so, within this context, the industry is less likely to undertake radical change to take account of the removal of further non-tariff restrictions to trade.

(b) The investment/return lead times in the industry are very long. It takes over three years to build a new plant and to develop a new car (the total production length for a car is, on average, 10 years, and the car is on the market for around 30 years). The industry's planning horizons take place over a significant time frame. The industry is therefore faced with large sunk costs in its plants and the timescales for radically altering the way in which vehicles are produced around Europe may be around a decade. Therefore, responses that have occurred over the three years since the completion of the single market programme are likely to be muted.

Table 10.2 shows the relative impact of the 'other factors' on our analysis.

Table 10.2. Other factors affecting our analysis

Hypothesis	Market conditions	German reunification	New model launches	Globalization	Currency fluctuations	Overcapacity	Low returns	Production and supply chain changes	Research initiatives and technological change	single market programme
1: Intra-EU trade at an aggregate level will increase		✓								
2: Degree of intra-EU trade relative to individual consumption will increase		✓	✓		✓✓					✓
3: Market shares will equalize	✓		✓✓		✓					✓
4: Variants available will increase				✓✓✓						✓
5: National sales relative to non-national sales will fall		✓	✓							✓
6: Domestic market shares will fall		✓	✓	✓						✓
7: Competition and concentration will increase	✓			✓✓✓		✓	✓			✓
8: Final prices will become less variable										
9: Marketing and distribution networks will be developed										✓
10: Production costs will fall								✓✓	✓✓	✓

Table 10.2. (continued)

Hypothesis	Market conditions	German reunification	New model launches	Globalization	Currency fluctuations	Overcapacity	Low returns	Production and supply chain changes	Research initiatives and technological change	single market programme
11: Productivity will increase									✓✓	✓
12: Employment will fall	✓			✓✓						
13: Investment in the EU will change				✓						✓
14: Components supply structure will become pan-European								✓✓	✓	✓
15: RD&D costs will fall										✓✓✓
16: Global competitiveness of the EU-owned automotive industry will increase	✓			✓✓	✓					✓

Table 10.2 shows that the key other factors impacting on the marketing side of the automotive industry are globalization of competition, new model launches, relative market conditions and currency fluctuations. The key other factors impacting on the production and purchasing side of the business are production and supply chain changes and research initiatives and technological change.

Indirectly, the single market has helped reinforce (and has itself been reinforced by) many of these factors. In addition, there are a number of additional factors which should be considered:

(a) clear guidance on 'rules of origin' has encouraged several overseas manufacturers to set up plant within the EU over the past decade introducing new production techniques to Europe and increasing the supply of highly competitive products;
(b) the policy to reduce and eliminate quotas on Japanese imports by 1999 has had a very major effect on competition and the position of European producers, particularly in the previously more protected markets;
(c) the Association Agreements with Central and Eastern European countries, through reducing tariffs and providing a pathway to full membership of the EU has facilitated trends to invest in low cost production facilities outside the EU;
(d) the reduction in pan-European distribution costs and times and the improvements in pan-European transport infrastructure is facilitating new approaches to logistics.

For these reasons, the indirect effects of the single market programme and related European programmes may have been more important than the direct effects. These policies have reinforced strong trends occurring in the global economy and it may have brought forward by several years structural adjustments to the European motor vehicles industry. This is likely to be of significant importance for the European industry in global terms.

10.2. Benefits of the single market programme

10.2.1. Benefits to vehicle assemblers

As described above, the single market programme has reinforced many of the global trends which were prevalent over the time period in question. This is particularly the case if the single market programme has been a factor in attracting FDI from Japanese firms. The Japanese promotion of lean production techniques to the indigenous EU vehicle assemblers has been an important development which might have happened later had the single market programme not been implemented. For example, companies have been increasingly attempting to penetrate markets outside the EU and the single market has made it easier for them to do this by lowering the administrative barriers to trade between Member States.

The most direct benefit to the automotive assemblers has been the whole vehicle type approval measure which has meant that new models can be introduced throughout Europe without the requirement to gain separate type approval in each Member State. This has resulted in very positive time savings to market, and in use of fewer and cheaper vehicles in the tests. This has benefited the automotive manufacturers by allowing them to develop a more clear purchasing strategy, by seeking the best method of purchasing on an international basis.

An important by-product of the single market programme for the commercial vehicle sector is that it has facilitated the emergence of very large pan-European freight distribution companies which have very significant purchasing power. These groups will expect to deal with

manufacturers directly, and the franchised dealership network is there to support the vehicles once they are in use, rather than to sell the vehicles. Whether the increased market power of distributors is a benefit in the long run is another question.

10.2.2. Benefits to component manufacturers

Whilst the components sector was only considered indirectly in our study, there is clear evidence that manufacturers have also seen some benefits as a result of the single market programme. Component manufacturers have traditionally been much more focused on their domestic markets. Intra-EU trade, particularly from peripheral countries of Europe, has radically increased. The single market has greatly facilitated this trend.

10.2.3. Welfare benefits

The single market has benefited consumers in a number of important respects.

First, by making type approval measures consistent across all Member States and allowing type approval in one Member State to be applied to all Member States, the single market programme has contributed to lowering market entry costs. The consequences for consumers are twofold: a small but positive benefit in terms of reduced costs per model; and a second, arguably more important, benefit in terms of greater choice of models and variants within each Member State market. In this way, distortions in the market caused by differences in regulatory requirements have been removed, and therefore the efficiency of the market has improved. It should be noted that, in theory at least, having markets which are in some respects more competitive (e.g. more models and variants available) should lead to further pressure on prices, with welfare benefits to consumers in aggregate.

Second, the single market programme is complementary to, and serves to reinforce the efforts of the vehicle manufacturers to create pan-European sales and distribution systems under which consumers can be more readily assured of consistent sales and service support wherever they may be located within the EU. In its broadest sense, this contributes to the goal of greater freedom of movement within the European Union.

Third, the single market has encouraged the emergence of large, pan-European freight distribution companies in the commercial vehicle sector. The larger companies have greater purchasing power relative to the vehicle manufacturers or importers, and are therefore able to secure better terms for the supply of commercial vehicles. This class of consumers (i.e. industrial) has certainly therefore benefited from the single market programme.

Sustainable development

It should also be noted that the contribution of new emission and crash impact standards towards sustainable development is at best partial, and sometimes contradictory. For example, in order to improve the performance of cars in frontal and side impacts, vehicle manufacturers have increased the weight of steel used in the car body structure, and this in turn will lead to greater fuel consumption (and hence emissions) than was hitherto the case. Equally, the stricter emission standards that have been introduced have resulted in the widespread use of catalytic converters in the exhaust system. While this enables pollutants such as NOx to be reduced *per se*, there are two negative effects which do not contribute to sustainable

development: greater fuel consumption (and hence CO_2 emissions); and greater initial levels of pollutants while the catalyst warms up.

The EU has no definition as such of sustainable development in the automotive sector. There is no mechanism to allow the trade-off between reductions in pollutants in one area against increases in pollutants in another. The proposed Carbon Tax marks a further step towards defining an environmentally optimized vehicle, but is still not comprehensive enough to constitute a holistic and whole life cycle approach.

At a general level, we would note that in so far as the SMP has increased the size of the market, there will be associated environmental costs in producing the extra vehicles required. Secondly, in so far as the SMP has increased trade in both components and finished vehicles, there will be increased environmental costs. In both cases, it is of course possible that improved plant level efficiency will offset the added environmental costs.

10.3. Concerns about the single market programme

Any major initiative like the single market programme will give rise to a series of concerns as well as benefits. Here, we focus on a key concern, which is the lack of global standards. There is a danger that the development of standards within the single market programme might be on a different course to the rest of the world. If this were to continue, there might be serious disbenefits for the EU automotive manufacturers in the future. It is possible that if the standards set in the EU are out of step with that in much of the rest of the world, the EU automotive manufacturers could face serious additional cost barriers in accessing other markets in the future. The European Commission has recently undertaken to reduce this problem through involvement in efforts to harmonize global standards.

Many manufacturers complained to us during our interviews of the cost of complying with safety and environmental regulations. Current moves towards an economic approach to regulation will be an important factor in helping to minimize the costs and maximize the benefits of future regulations.

10.4. Future actions

Despite the fact that the single market programme has gone a long way to improving the competitive environment in the EU automotive industry, we suggest there are a number of areas where careful consideration should be given to future action. We have considered these at three levels:

(a) constraints which currently create cost burdens for the industry and restrict market access;
(b) constraints which may not restrict market access, but act as a barrier to rationalization of the industry and therefore affect the industry's ability to be fully competitive on a global basis;
(c) issues which have been raised by interested parties, but where our analysis suggests that the case for EU action has not been proven.

10.4.1. Constraints which create cost burdens and restrict market access

We consider that there are still a number of constraints which continue to create cost burdens for the industry:

(a) Member States have very different tax structures for vehicles. For example, six Member States based their ownership tax on the cubic capacity of the engine, four on the weight, two on the levels of horsepower and two on the fuel type used (see Appendix D). These differences impose large variant costs on producers. For example, Ford in introducing the Galaxy into the French market had to redesign its final drive ratio to ensure that it was taxed by the French authorities in the same class as the main competitor. This had major RD&D and production implications. Renault believe that the differences in tax legislation based on requirements of insurance and the size of engines add substantially to their production costs and estimate that (for one model) approximately 20% of variants arise through national differences in tax structures. They estimate the cost at ECU 4.27 million per vehicle. The different tax structures can also affect the distribution of certain specialist marques. For example, Volvo operates in the medium and large segments of the car market and does not offer small vehicles or engines below 1.3 litre capacity. Therefore, in markets where there are strong financial disincentives against larger cars or engines (e.g. Italy), Volvo is placed at a disadvantage.

(b) Exchange rate fluctuations impose difficulties on the industry and affect location. The cost of hedging against exchange rate fluctuations still exists in the Community. These difficulties of exchange rate fluctuation are more pronounced for the more nationally focused manufacturers who are less able to lay off exchange rate risks through location and sourcing decisions and sourcing patterns for components. Both Ford and Nissan mentioned that their Austrian dealers had suffered as a result of the devaluation of the Lira because Austrian consumers were crossing the border and buying vehicles in Italy to take advantage of the lower prices. For Volvo, movements in exchange rates can be significant, especially in terms of production in Sweden. For example, following the devaluation of the Krona in the early 1990s, output in Sweden was cheaper in key export markets but the purchasing costs were higher from leading supplier countries such as Germany.

(c) Different standards exist in each global market.[9] Our discussions with companies indicated to us that components standards in place throughout the world can be very different. These differences increase design costs and constrain production economies of scale. Given the greater fragmentation of the European industry and its smaller share of overseas trade compared with the American and Japanese industries, this can have an adverse impact. For example, Volvo finds that different basic regulations between the market in North America and that in the EU (on how truck length is measured) means that few EU-engineered and produced trucks sell in North America and few trucks built

[9] However, whilst standards do vary, they may be as a result of different customer demands. The standards are not the real problem, but the other factors which influence them. For example, Americans generally like big cars. They are therefore much wider than their European counterparts and their bumpers are also much wider. The side impact test in the US uses a ram which is wider than the ram used in the European test. The US ram covers both the A post and B post of the car, i.e. just in front of the front door and just behind it. The European test only covers the B post. Therefore, a European car has to have a hardened B post because it has to take a great deal of force compared with the US test which covers both. In Japan, the cars are a little larger than those from Europe and tend to have US-type bumpers and so the test in Japan is similar to the US one. The test for air bags is another interesting example. In the US, because there are no seat belt regulations, the air bag has to restrain the whole of the passenger, whereas in Europe, the air bag only has to restrain the head.

there are sold in the EU. Currently, these problems are very typical and officials from US and European motor industries have agreed to try and harmonize standards and certification to boost car trade across the Atlantic. Martin Bangemann, the EU's industry commissioner, has estimated that regulations to harmonize safety, emissions and seating systems across the Atlantic could reduce the cost of a car by up to 10%.

(d) There are different internal standards within the industry. Components suppliers therefore have to cope with the different quality standards imposed by the vehicle manufacturers, and some voluntary framework encouraged by policy makers would assist.

(e) Each Member State requires different forms from manufacturers in order to register new cars, primarily because the registration documents are used to determine the codes. Even though a Directive has been put in place in this area which provides for a consistent set of registration data (which is around 10 times as much as any one country actually uses), each Member State requires a different selection of data from this set and different presentations of the data. This imposes an extra administrative burden on producers.

(f) The type approval measures must be flexible enough and reviewed frequently enough to ensure that they keep up with innovation within the EU automotive industry. For example, there are currently no Europe-wide standards for the remote keyless entry across Europe. In Italy, the type approval authority will only accept test reports from its own government-owned and run test house. It also insists that all pieces of equipment, receivers and transmitters are tested, even when physical differences are very slight. It also only accepts payment via a visit to an Italian post office at two separate stages in the testing process. In Greece, for the same product, the approval process does accept other countries' test reports, but the approval process is very unpredictable (from 3 to 35 weeks). The Spanish authority only accept applications in a particular format, in Spanish and approved by an engineer of the Official Telecommunications Institute in Spain. Other countries therefore either have to follow a costly and complex joining process or use a consultant (this takes 3–5 months).

10.4.2. Constraints acting as a barrier to rationalization of the industry

We highlight two factors which may be impeding economically efficient rationalization of the industry:

(a) The definition of the relevant market in competition investigations – particularly in the components supply sector. Our findings indicate that the components supply industry is becoming increasingly European. However, there are a number of examples of national competition authorities taking a narrow view of the relevant market in merger cases. For example, the acquisition by a large pan-European piston manufacturer with German interests (T&N) of a smaller German domestic-based manufacturer (Goetze) was stopped by the German competition authorities on the basis of its impact on the German domestic market. Another example is ZF, a German independent manufacturer of transmission and steering systems, which was refused permission in 1993 to purchase a GM subsidiary, Allison Transmissions, because of concerns over monopoly in the German market.

(b) The industry is viewed as having too many nationally orientated players compared with the much larger competitors in the North American and Japanese markets. This constrains their longer term development. State aids have been provided to Member State manufacturers under the understanding that this will allow the producers to reduce

their capacity or re-engineer their processes. However, these state aids may have delayed some necessary rationalization of the European industry.

10.4.3. Issues in which the case for EU action has not yet been proven

(a) Member States have different ways of dealing with end-of-life vehicles which affect the demand profile in each market. For example, the recent French government's cash offers for consumers to trade in their cars has dramatically increased new car sales in the country. Whilst these may have different implications for each national producer and many provide an effective subsidy to producers with the larger market shares, they are not market closing in their own right. The case for harmonization of such regulations would need to be argued on environmental grounds. Indeed the Directorate General for the Environment's end-of-life vehicle proposal does not arise as a result of a perceived single market problem, but from a perceived environmental problem.

(b) Member States' tests to confirm the roadworthiness of vehicles at periodic stages of their life are still substantially different. The 1991 Roadworthiness Directive leaves considerable discretion with Member States over the frequency and scope of the tests. These differences do not affect market access, but may change the demand profile for spare parts and repair facilities in different Member States.

(c) The need to manufacture right-hand and left-hand drive vehicles in Europe affects market access for some low volume European producers, where the variant costs are higher than the benefits of selling the models in the non-domestic markets. For global players, the need to supply both left- and right-handed drive models is less important, because there are important markets for both variants around the world. Indeed, a UK Monopolies and Mergers Report concluded that right-hand drive models for the UK and Ireland does not impose significant costs on producers. However, we understand that Lancia pulled out of the UK market because of the costs of developing such variants. Volvo told us that the changes required to engineer a car to right-hand drive affected 15% of the total car, by value.

10.4.4. Actions required from a safety perspective

Whilst we were not asked to investigate safety issues as part of our analysis, our interviews with consumer protection organizations indicated to us that there may be a requirement for regulations in the area of head restraints, back seat strength and child restraints. Furthermore, differentiated safety standards across the global market could create problems for the automotive manufacturers in the long run as they continue to trade with other states around the world but find that they have to make more and more changes to standards to gain entry.

APPENDIX A

Technical harmonization

The sector measures essentially involve the progressive replacement of a body of detailed technical rules in each Member State. These rules ensured the safety of users and third parties and provided for acceptable environmental impact. Whilst most of the rules concerned components and subsystems of vehicles, a key element of the national controls were (differing) systems of type approval for whole vehicles. Essentially, these involved administrative procedures to ensure all the detailed rules had been met. Until this element was brought into life, car and component manufacturers had to go through different type approval procedures across the Member States. This final element was harmonized across the Community through the introduction of a single system of type approval of vehicles which will eventually replace all the existing national systems.

Technical harmonization, which began in 1970 with measures relating to noise levels and exhaust gases, was completed for private cars through the adoption in June 1992 of the last three of the 45 directives laying down rules for vehicle design. These rules made it possible for a single EU type approval system to be agreed in January 1993 (70/156/EEC amended by 92/53/EEC). The full type approval system for new and existing passenger cars will formally replace national procedures on 1 January 1998. EC type approval remains optional for other road vehicles.

The diagram above shows that technical harmonization can be categorized into legal measures (of which the two main approaches are new approach directives and specific directives), and standards, such as those set by CEN and CENELEC. We cover these main categories below:

(a) Historically, the Commission has followed an approach of proposing separate directives to harmonize technical requirements. These set specific technical requirements on particular products such as tyres and safety glass. There are now 45 separate directives relating to the type approval of components, systems, and technical units. These started to be put into place during the 1970s, i.e. before the single market programme was developed. Changes to separate directives as a result of new technical or safety requirements ('adaptation to technical progress') are made by regulatory committees consisting of Member States' representatives and chaired by the Commission, which submits a proposal to amend a directive.

(b) New approach (framework) directives are horizontal in nature and require specific standards for each application. However, the new approach directives have had little effect on the industry and the directives usually explicitly exclude cars. The sole exception we discovered was the new CEN standard under the Pressure Vessels Directive for the brake systems of trucks and buses. The 'new' approach was set out in a Council Resolution of 7 May 1983 and in Directive 83/189/EEC. The new approach directives have three main principles: a distinction is drawn between what must be harmonized in legislation and what may be left to be harmonized by European standardization bodies; legislative harmonization must be restricted to laying down health, safety and other essential requirements; and harmonization of industrial standards should be achieved by the elaboration of European standards which should be

developed by CEN or CENELEC as appropriate. Examples of these new approach directives include those relating to pressure vessels, electro-magnetic compatibility and machine safety. These so-called 'new approach directives' mandate the development of standards for specific purposes which are negotiated and developed by standards-making bodies such as CEN and CENELEC. Under the single market programme, the Community's approach is increasingly to use these new approach directives, rather than the older directives in setting standards.

(c) Standards are set by official standard-setting bodies such as CEN, CENELEC, national standards authorities, individual companies such as VAG and Ford or by trade associations such as VDA in Germany. Standards set by the official bodies can be either mandated or non-mandated. Mandated standards would apply to the standards set under the new approach directives.

APPENDIX B

B.1. Sectoral legislation

Title	Measure	Description	Influence (initial view)	Focus	Cars or commercial vehicles
Whole Vehicle Type Approval	92/53/EEC of 18 June 1992 (latest amendment)	Type approval is carried out by one MS which provides a certificate which is valid in all MSs (Appendix B2 provides a list of the individual measures which were not formally part of the 286 single market measures)	High Medium Medium	RD&D Manufact -uring Suppliers	Cars
Roadworthiness test	94/23/EC of 8 June 1994 (latest)	States that MSs must carry out periodic roadworthiness tests and provide a certificate proving that they have done so	Low High	RD&D Sales	Cars
Mechanical coupling devices	94/20/EC of 30 May 1994	Part of the type approval regime. States that coupling devices must conform to certain standards	Low	RD&D	Cars
Lateral protection for goods vehicles	89/297/EEC of 13 April 1989	Provides technical requirements for side protection of heavy goods vehicles and their trailers	Low	RD&D	CVs
Weights and dimensions (cars)	92/21/EEC of 31 March 1992	Harmonizes national laws concerning the weights and dimensions of cars. Covers maximum dimensions, weights and towed weight	Low	RD&D	Cars
Interior fittings	91/662/EEC of 6 December 1991	Harmonizes the technical requirements for the behaviour of the steering device under impact	Low Medium	RD&D Suppliers	Both
Tyres	92/23/EEC of 31 March 1992	Harmonizes national type approval for tyres and their fitting	Low Medium	RD&D Suppliers	Both
Tyre pressure gauges	86/217/EEC of 26 May 1986	Harmonizes national provisions relating to tyre pressure gauges in order to facilitate trade	Low Medium	RD&D Suppliers	Both
Safety glass and glazing materials	92/22/EEC of 31 March 1992	Brings into line national provisions and relates to type approval in terms of materials used and their installation	Low Medium	RD&D Suppliers	Both
Motor vehicle noise	92/97/EEC of 10 November 1992 (latest)	Lays down limits on the noise level of the mechanical parts and exhaust systems	Medium	RD&D	Both
Air pollution: passenger cars	94/12/EC of 23 March 1994 (latest)	Establishes limit values for emissions from cars	Medium	RD&D	Cars
Emission of gaseous pollutants from diesel engines	91/542/EEC of 1 October 1991 (latest)	Technical requirements for diesel engines to combat air pollution	Low	RD&D	CVs
Sulphur content of certain liquid fuels	93/12/EEC of 23 March 1993	Limits the sulphur content of gasoline and kerosene (derogation for Greece until 1999)	Low	RD&D	Both
Spray-suppression devices	91/226/EEC of 27 March 1991	Harmonizes the type approval procedures for spray-suppression devices	Low	RD&D	Both
Road vehicles: weights and dimensions	92/7/EEC of 10 February 1992	Lays down maximum weights and dimensions for large vehicles	Low	RD&D	CVs

Title	Measure	Description	Influence (initial view)	Focus	Cars or commercial vehicles
Speed limitation devices for heavy goods and coaches	92/24/EEC of 31 March 1992	Limits the maximum speed for heavy vehicles used to carry goods or passengers	Low	RD&D	Cvs
Speed limitation devices for commercial vehicles	92/6/EEC of 10 February 1992	Limits maximum speed of commercial vehicles	Low	RD&D	CVs
External projections on cabs of commercial vehicles	92/114/EEC of 17 December 1992	Relates to the external projections forward of the cab's rear panel	Low	RD&D	CVs
Opening up of Japanese imports		From 1981 to 1993, Japanese imports have been restricted in five markets. New agreement in 1991 which covers the 1990s – 8.1% of total market by 1999	High	All	Both
Block exemption	Article 5(3) of Treaty of Rome and Regulation (EC) No 1475/1995 of 28 June 1995 (latest)	Automotive distribution sales and servicing exempted from certain provisions of EC competition law. Later regulation intensifies competition in this area	High	Sales	Both
Environment	COM(91) 219 final 89/458/EEC, 88/77/EEC, 70/157/EEC, 85/210/EEC, 87/416/EEC.	Stricter limits on emissions and sound from vehicles. Council Directives ensure the availability of unleaded petrol and require the reduction of the maximum lead content in petrol	Medium	Manufac-turing (increased production of engines which take unleaded petrol)	Cars

B.2. Technical harmonization measures

The following list provides further details on the technical harmonization measures:

No.	Reference	Adopted by	Title	Date of adoption	OJ (L) No. and page	Date of the OJ
01	**70/157/EEC**	Council	**Permissible sound level and the exhaust system of motor vehicles**	06.02.1970	42/16	23.02.1970
	73/350/EEC	Commission	Adaptation	07.11.1973	321/33	22.11.1973
	77/212/EEC	Council	Amendment	08.03.1977	66/33	12.03.1977
	81/334/EEC	Commission	Adaptation	13.04.1981	131/6	18.05.1981
	84/372/EEC	Commission	Adaptation	03.07.1984	196/47	26.07.1984
	84/424/EEC	Council	Amendment	03.09.1984	238/31	06.09.1984
	89/491/EEC	Commission	Adaptation	17.07.1989	238/43	15.08.1989
	92/97/EEC	Council	Amendment	10.11.1992	371/1	19.12.1992
02	**70/220/EEC**	Council	**Measures to be taken against air pollution by emissions from motor vehicles** - Corrigendum	20.03.1970	76/1 81/15	06.04.1970 11.04.1970
	74/290/EEC	Council	Adaptation	28.05.1974	159/61	15.06.1974
	77/102/EEC	Commission	Adaptation	30.11.1976	32/32	03.02.1977
	78/665/EEC	Commission	Adaptation	14.07.1978	223/48	14.08.1978
	83/351/EEC	Council	Amendment	16.06.1983	197/1	20.07.1983
	88/76/EEC	Council	Amendment	03.12.1987	36/1	09.02.1988
	88/436/EEC	Council	Amendment	16.06.1988	214/1	06.08.1988
	89/458/EEC	Council	Amendment (cars <1,4 l) - Corrigendum	18.07.1989	226/1 270/16	03.08.1989 19.09.1989
	89/491/EEC	Commission	Adaptation	17.07.1989	238/43	15.08.1989
	91/441/EEC	Council	Amendment	26.06.1991	242/1	30.08.1991
	93/59/EEC	Council	Amendment	28.06.1993	186/21	28.07.1993
	94/12/EC	EP & Council	Amendment	23.03.1994	100/42	19.04.1994
03	**70/221/EEC**	Council	**Liquid fuel tanks and rear protective devices for motor vehicles and their trailers** - Corrigendum (FR-EN-IT-NL-DA)	20.03.1970	76/23 65/42	06.04.1970 15.03.1979
	79/490/EEC	Commission	Adaptation	18.04.1979	128/22	26.05.1979
	81/333/EEC	Commission	Adaptation	13.04.1981	131/4	18.05.1981

No.	Reference	Adopted by	Title	Date of adoption	OJ (L) No. and page	Date of the OJ
04	**70/222/EEC**	Council	**Space for mounting and the fixing of rear registration plates on motor vehicles and their trailers**	20.03.1970	76/25	06.04.1970
05	**70/311/EEC**	Council	**Steering equipment for motor vehicles and their trailers**	08.06.1970	133/10	18.06.1970
			- Corrigendum		196/14	03.09.1970
	92/62/EEC	Commission	Adaptation	02.07.1992	199/33	18.07.1992
06	**70/387/EEC**	Council	**Doors of motor vehicles and their trailers**	27.07.1970	176/5	10.08.1970
07	**70/388/EEC**	Council	**Audible warning devices for motor vehicles**	27.07.1970	176/12	10.08.1970
			- Corrigendum		176/72	21.06.1974
08	**71/127/EEC**	Council	**Rear-view mirrors of motor vehicles**	01.03.1971	68/1	22.03.1971
	79/795/EEC	Commission	Adaptation	20.07.1979	239/1	22.09.1979
	85/205/EEC	Commission	Adaptation	18.02.1985	90/1	29.03.1985
	86/562/EEC	Commission	Adaptation	06.11.1986	327/49	22.11.1986
	88/321/EEC	Commission	Adaptation	16.05.1988	147/77	14.06.1988
09	**71/320/EEC**	Council	**Braking devices of certain categories of motor vehicles and their trailers**	26.07.1971	202/37	06.09.1971
	74/132/EEC	Commission	Adaptation	11.02.1974	74/7	19.03.1974
	75/524/EEC	Commission	Adaptation	25.07.1975	236/3	08.09.1975
	79/489/EEC	Commission	Adaptation	18.04.1979	128/12	26.05.1979
			- Corrigendum		146/35	14.06.1979
	85/647/EEC	Commission	Adaptation	23.12.1985	380/1	31.12.1985
	88/194/EEC	Commission	Adaptation	24.03.1988	92/47	09.04.1988
	91/422/EEC	Commission	Adaptation	15.07.1991	233/21	22.08.1991
10	**72/245/EEC**	Council	**Suppression of radio interference produced by spark-ignition engines fitted to motor vehicles**	20.06.1972	152/15	06.07.1972
	89/491/EEC	Commission	Adaptation	17.07.1989	238/43	15.08.1989
11	**72/306/EEC**	Council	**Measures to be taken against the emission of pollutants from diesel engines for use in vehicles**	02.08.1972	190/1	20.08.1972
			- Corrigendum (FR-EN-IT-NL-DA)		215/20	06.08.1974
			- Corrigendum (FR-EN)		297/27	23.11.1977
	89/491/EEC	Commission	Adaptation	17.07.1989	238/43	15.08.1989

No.	Reference	Adopted by	Title	Date of adoption	OJ (L) No. and page	Date of the OJ
12	**74/60/EEC**	Council	**Interior fittings of motor vehicles (interior parts of the passenger compartment other than the interior rear-view mirrors, layout of controls, the roof or sliding roof, the backrest and rear part of seats)**	17.12.1973	38/2	11.02.1974
			- Corrigendum		215/20	06.08.1974
	78/632/EEC	Commission	Adaptation	19.05.1978	206/26	29.07.1978
13	**74/61/EEC**	Council	**Devices to prevent the unauthorized use of motor vehicles**	17.12.1973	38/22	11.02.1974
			- Corrigendum (FR-EN-IT-NL-DA)		215/20	06.08.1974
14	**74/297/EEC**	Council	**Interior fittings of motor vehicles (the behaviour of the steering mechanism in the event of an impact)**	04.06.1974	165/16	20.06.1974
	91/662/EEC	Commission	Adaptation	06.12.1991	366/1	31.12.1991
			- Corrigendum		172/86	27.06.1992
15	**74/408/EEC**	Council	**Interior fittings of motor vehicles (strength of seats and of their anchorages)**	22.07.1974	221/1	12.08.1974
	81/577/EEC	Council	Amendment	20.07.1981	209/34	29.07.1981
16	**74/483/EEC**	Council	**External projections of motor vehicles**	17.09.1974	266/4	02.10.1974
	79/488/EEC	Commission	Adaptation	18.04.1979	128/1	26.05.1979
17	**75/443/EEC**	Council	**Reverse and speedometer equipment of motor vehicles**	26.06.1975	196/1	26.07.1975
			- Corrigendum		296/19	15.11.1975
18	**76/114/EEC**	Council	**Statutory plates and inscriptions for motor vehicles and their trailers and their location and method of attachment**	18.12.1975	24/1	30.01.1976
	78/507/EEC	Commission	Adaptation	19.05.1978	155/31	13.06.1978
19	**76/115/EEC**	Council	**Anchorages for motor vehicle safety belts**	18.12.1975	24/6	30.01.1976
	81/575/EEC	Council	Amendment	20.07.1981	209/30	29.07.1981
	82/318/EEC	Commission	Adaptation	02.04.1982	139/9	19.05.1982
	90/629/EEC	Commission	Adaptation	30.10.1990	341/14	06.12.1990
20	**76/756/EEC**	Council	**Installation of lighting and light-signalling devices on motor vehicles and their trailers**	27.07.1976	262/1	27.09.1976

No.	Reference	Adopted by	Title	Date of adoption	OJ (L) No. and page	Date of the OJ
	80/233/EEC	Commission	Adaptation - Corrigendum (FR-EN-DE-IT-NL-DA)	21.11.1979	51/8 111/22	25.02.1980 30.04.1980
	82/244/EEC	Commission	Adaptation	17.03.1982	109/31	22.04.1982
	83/276/EEC	Council	Amendment	26.05.1983	151/47	09.06.1983
	84/8/EEC	Commission	Adaptation	14.12.1983	9/24	12.01.1984
	89/278/EEC	Commission	Adaptation - Corrigendum	28.03.1989	109/38 114/52	20.04.1989 27.04.1989
	91/663/EEC	Commission	Adaptation and codification - Corrigendum (FR-DE)	10.12.1991	366/17 172/87	31.12.1991 27.06.1992
21	**76/757/EEC**	Council	**Reflex reflectors for motor vehicles and their trailers**	27.07.1976	262/32	27.09.1976
22	**76/758/EEC**	Council	**End-outline market lamps, front position (side) lamps, rear position (side) lamps and stop lamps for motor vehicles and their trailers**	27.07.1976	262/54	27.09.1976
	89/516/EEC	Commission	Adaptation	01.08.1989	265/1	12.09.1989
23	**76/759/EEC**	Council	**Direction indicator lamps for motor vehicles and their trailers**	27.07.1976	262/71	27.09.1976
	89/277/EEC	Commission	Adaptation - Corrigendum	28.03.1989	109/25 114/52	20.04.1989 27.04.1989
24	**76/760/EEC**	Council	**Rear registration plate lamps for motor vehicles and their trailers**	27.07.1976	262/85	27.09.1976
25	**76/761/EEC**	Council	**Motor vehicle headlamps which function as main-beam and/or dipped-beam headlamps and incandescent electric filament lamps for such headlamps**	27.07.1976	262/96	27.09.1976
	89/517/EEC	Commission	Adaptation	01.08.1989	265/15	12.09.1989
26	**76/762/EEC**	Council	**Front fog lamps for motor vehicles and filament lamps for such lamps**	27.07.1976	262/122	27.09.1976
27	**77/389/EEC**	Council	**Motor vehicle towing devices**	17.05.1977	145/41	13.06.1977
28	**77/538/EEC**	Council	**Rear fog lamps for motor vehicles and their trailers** - Corrigendum (FR-EN-DE-IT-NL-DA)	28.06.1977	220/60 284/11	29.08.1977 10.10.1978
	89/518/EEC	Commission	Adaptation	01.08.1989	265/24	12.09.1989
29	**77/539/EEC**	Council	**Reversing lamps for motor vehicles and their trailers** - Corrigendum (FR-EN-DE-IT-NL-DA)	28.06.1977	220/72 284/11	29.08.1977 10.10.1978

No.	Reference	Adopted by	Title	Date of adoption	OJ (L) No. and page	Date of the OJ
30	**77/540/EEC**	Council	**Parking lamps for motor vehicles** - Corrigendum (FR-EN-DE-IT-NL-DA)	28.06.1977	220/83 284/12	29.08.1977 10.10.1978
31	**77/541/EEC**	Council	**Safety belts and restraint systems of motor vehicles**	28.06.1977	220/95	29.08.1977
	81/576/EEC	Council	Amendment	20.07.1981	209/32	29.07.1981
	82/319/EEC	Commission	Adaptation	02.04.1982	139/17	19.05.1982
	90/628/EEC	Commission	Adaptation - Corrigendum	30.10.1991	341/1 10/56	06.12.1990 16.01.1992
32	**77/649/EEC**	Council	**Field of vision of motor vehicle drivers** - Corrigendum (FR-EN-DE-IT-NL-DA) - Corrigendum (FR-DE-IT-NL-DA)	27.09.1977	267/1 150/6 284/11	19.10.1977 06.06.1978 10.10.1978
	81/643/EEC	Commission	Adaptation	29.07.1981	231/41	15.08.1981
	88/366/EEC	Commission	Adaptation	17.05.1988	181/40	12.07.1988
	90/630/EEC	Commission	Adaptation	30.10.1990	341/20	06.12.1990
33	**78/316/EEC**	Council	**Interior fittings of motor vehicles (identification of controls, tell-tales and indicators)**	21.12.1977	81/3	28.03.1978
	93/91/EEC	Commission	Adaptation	29.10.1993	284/25	19.11.1993
	94/53/EC	Commission	Amendment	15.11.1994	299/26	
34	**78/317/EEC**	Council	**Defrosting and demisting systems of glazed surfaces of motor vehicles**	21.12.1977	81/27	28.03.1978
35	**78/318/EEC**	Council	**Wiper and washer systems of motor vehicles**	21.12.1977	8.1.49	28.03.1978
	94/68/EC	Commission	Adaptation	16.12.1994	354/1	31.12.1994
36	**78/548/EEC**	Council	**Heating systems for the passenger compartment of motor vehicles**	12.06.1978	168/40	26.06.1978
37	**78/549/EEC**	Council	**Wheel guards of motor vehicles**	12.06.1978	168/45	26.06.1978
	94/78/EC	Commission	Adaptation	21.12.1994	354/10	31.12.1994
38	**78/932/EEC**	Council	**Head restraints of seats of motor vehicles**	16.10.1978	325/1	20.11.1978
39	**80/1268/ EEC**	Council	**Fuel consumption of motor vehicles**	16.12.1980	375/36	31.12.1980
	89/491/EEC	Commission	Adaptation	17.07.1989	238/43	15.08.1989
	93/116/EEC	Commission	Adaptation - Corrigendum	17.07.1989	329/39 42/27	30.12.1993 15.02.1994

No.	Reference	Adopted by	Title	Date of adoption	OJ (L) No. and page	Date of the OJ
40	**80/1269/ EEC**	Council	**Engine power of motor vehicles**	16.12.1980	375/46	31.12.1980
	88/195/EEC	Commission	Adaptation - Corrigendum (EN)	24.03.1988	92/50	09.04.1988
	89/491/EEC	Commission	Adaptation	17.07.1989	238/43	15.08.1989
41	**88/77/EEC**	Council	**Measures to be taken against the emission of gaseous pollutants from diesel engines for use in vehicles**	03.12.1987	36/33	09.02.1988
	91/542/EEC	Council	Amendment	01.10.1991	295/1	25.10.1991
42	**89/297/EEC**	Council	**Lateral protection (side guards) of certain motor vehicles and their trailers**	13.04.1989	124/1	05.05.1989
43	**91/226/EEC**	Council	**Spray-suppression systems of certain categories of motor vehicles and their trailers**	27.03.1991	103/5	23.04.1991
44	**92/21/EEC**	Council	**Masses and dimensions of motor vehicles of category M1**	31.03.1992	129/1	14.05.1992
45	**92/22/EEC**	Council	**Safety glazing and glazing materials on motor vehicles and their trailers**	31.03.1992	129/11	14.05.1992
46	**92/23/EEC**	Council	**Tyres for motor vehicles and their trailers and their fitting**	31.03.1992	129/95	14.05.1992
47	**92/24/EEC**	Council	**Speed limitation devices or similar speed limitation on-board systems of certain categories of motor vehicles**	31.03.1992	129/154	14.05.1992
48	**92/114/EEC**	Council	**External projections forward of the cab's rear panel of motor vehicles of category N**	17.12.1992	409/17	31.12.1992
49	**94/20/EC**	EP & Council	**Mechanical coupling devices of motor vehicles and their trailers and their attachment to those vehicles**	30.05.1994	195/1	29.07.1994

B.3. List of technical harmonization directives and applicability

The table below shows the applicability of each of the technical harmonization directives. The codes for the columns which show the applicability of the measures are provided in full below the tables. However, in broad terms, 'M' represents cars, 'N' trucks and 'O' trailers. The measures are provided in chronological order. Towards the end of the table, we have included a number of measures which have not yet been fully agreed (Nos 50 to 57).

Subject	Directive	Applicability									
		M1	M2	M3	N1	N2	N3	O1	O2	O3	O4
1 Sound levels	70/157/EEC	x	x	x	x	x	x				
2 Emissions	70/220/EEC	x	x	x	x	x	x				
3 Fuel tanks/rear protective devices	70/221/EEC	x	x	x	x	x	x	x	x	x	x
4 Rear registration plate place	70/222/EEC	x	x	x	x	x	x	x	x	x	x
5 Steering effort	70/311/EEC	x	x	x	x	x	x	x	x	x	x
6 Door latches and hinges	70/387/EEC	x			x	x	x	x	x	x	x
7 Audible warning	70/388/EEC	x	x	x	x	x	x				
8 Rear visibility	71/127/EEC	x	x	x	x	x	x				
9 Braking	71/320/EEC	x	x	x	x	x	x	x	x	x	x
10 Suppression (radio)	72/245/EEC	x	x	x	x	x	x				
11 Diesel smoke	72/306/EEC	x	x	x	x	x	x				
12 Interior fittings	74/60/EEC	x									
13 Anti-theft	74/61/EEC	x	x	x	x	x	x				
14 Protective steering	74/297/EEC	x			x						
15 Seat strength	74/408/EEC	x	x	x	x	x	x				
16 Exterior projections	74/483/EEC	x									
17 Speedometer and reverse gear	75/443/EEC	x	x	x	x	x	x				
18 Plates (statutory)	76/114/EEC	x	x	x	x	x	x	x	x	x	x
19 Seat belt anchorages	76/115/EEC	x	x	x	x	x	x				

Subject	Directive	Applicability									
		M1	M2	M3	N1	N2	N3	I	O2	O3	O4
20 Installation of lighting and light signalling devices	76/756/EEC	x	x	x	x	x	x	x	x	x	x
21 Reflex reflectors	76/757/EEC	x	x	x	x	x	x	x	x	x	x
22 End-outline, front-side, rear-side, stop, day time running, side-marker lamps	76/758/EEC	x	x	x	x	x	x	x	x	x	x
23 Direction indicators	76/759/EEC	x	x	x	x	x	x	x	x	x	x
24 Rear registration plate lamps	76/760/EEC	x	x	x	x	x	x	x	x	x	x
25 Head lamps (including bulbs)	76/761/EEC	x	x	x	x	x	x				
26 Front fog lamps	76/762/EEC	x	x	x	x	x	x				
27 Towing hooks	77/389/EEC	x	x	x	x	x	x				
28 Rear fog lamps	77/538/EEC	x	x	x	x	x	x	x	x	x	x
29 Reversing lamps	77/539/EEC	x	x	x	x	x	x	x	x	x	x
30 Parking lamps	77/540/EEC	x	x	x	x	x	x				
31 Seat belts	77/541/EEC	x	x	x	x	x	x				
32 Forward vision	77/649/EEC	x									
33 Identification of controls	78/316/EEC	x	x	x	x	x	x				
34 Defrost/demist	78/317/EEC	x									
35 Wash/wipe	78/318/EEC	x									
36 Heating systems	78/548/EEC	x									
37 Wheel guards	78/549/EEC	x									
38 Head restraints	78/932/EEC	x									
39 Fuel consumption	80/1268/EEC	x									
40 Engine power	80/1269/EEC	x	x	x	x	x	x				
41 Diesel emissions	88/77/EEC	x	x	x	x	x	x				
42 Lateral protection	89/297/EEC					x	x			x	x
43 Anti-spray devices	91/226/EEC					x	x			x	x

Subject	Directive	Applicability									
		M1	M2	M3	N1	N2	N3	O1	O2	O3	O4
44 Masses and dimensions (cars)	92/21/EEC	x									
45 Safety glass	92/22/EEC	x	x	x	x	x	x	x	x	x	x
46 Tyres	92/23/EEC	x	x	x	x	x	x	x	x	x	x
47 Speed limiters	92/24/EEC			x		x	x				
48 External projections of cabs	92/114/EEC				x	x	x				
49 Couplings	94/20/EC	x	x	x	x	x	x	x	x	x	x
50 Masses and dimensions (other than vehicles referred to in item 44)	95/48/EC										
53 Front impact	95/.../EC										
54 Side impact	96/27/EC										
55 Animal transport vehicles	95/.../EC										
56 ADR vehicles	95/.../EC										
57 Head lamp cleaners	95/.../EC										

1	Category M	Motor vehicles with at least four wheels used for the carriage of passengers
	Category M_1	Vehicles used for the carriage of passengers and comprising no more than eight seats in addition to the driver's seat
	Category M_2	Vehicles used for the carriage of passengers, comprising more than eight seats in addition to the driver's seat and having a maximum mass not exceeding 5 tonnes
	Category M_3	Vehicles used for the carriage of passengers, comprising more than eight seats in addition to the driver's seat and having a maximum mass exceeding 5 tonnes
2	Category N	Motor vehicles with at least four wheels used for the carriage of goods
	Category N_1	Vehicles used for the carriage of goods and having a maximum mass not exceeding 3.5 tonnes
	Category N_2	Vehicles used for the carriage of goods and having a maximum mass exceeding 3.5 tonnes but not exceeding 12 tonnes
	Category N_3	Vehicles used for the carriage of goods and having a maximum mass exceeding 12 tonnes
3	Category O	Trailers (including semi-trailers)
	Category O_1	Trailers with a maximum mass not exceeding 0.75 tonnes
	Category O_2	Trailers with a maximum mass exceeding 0.75 tonnes but not exceeding 3.5 tonnes
	Category O_3	Trailers with a maximum mass exceeding 3.5 tonnes but not exceeding 10 tonnes
	Category O_4	Trailers with a maximum mass exceeding 10 tonnes

APPENDIX C

Horizontal measures

The table below provides the horizontal measures which have affected the automotive sector.

Title	Measure	Description	Influence (initial view)	Focus	Cars or CVs
Public procurement	93/36/EEC 93/23/EEC 90/531/EEC	If a contract for works or services is (partially) funded by the public sector and exceeds certain thresholds, then it must be put out to tender through an official process. There has also been progress in eliminating discrimination against European suppliers for US Government procurement.	High	Sales & distribution (as a result of increased cross-border procurement of vehicles for defence, health care, emergency services and utilities)	CVs
Transport	92/106/EEC (11.6.92); 3578/92 (7.12.92); 1841/88 (21.6.88); 881/92 (26.3.92); 91/440/EEC (29.7.91)	Introduction of a number of financial and practical incentives to promote multi-modal transport for freight. Liberalization of road haulage industry leading to increased competition. Abolition of all permits and quotas between Member States for road haulage. Improvements in rail system planned and liberalization of air transport.	Medium	Sales & distribution	CVs
Health & safety	89/391/EEC sets out basic responsibilities. 13+ other Directives give further detail	The Safety Framework Directive requires worker consultation, appointments of staff or subcontractors to monitor it. Workplace Directive lays down minimum health and safety requirements. Safety signs must also be used. Pregnant women are also given special protection. There are rules for the safe use of VDUs, heavy loads, dangerous substances, personal protective clothing.	Medium	Manufacturing (different standards affect productivity of plants in different MSs)	Both
Corporate taxation	90/434–436/ EEC	The taxation of (cross-border) mergers Directive allows for deferral of taxation charges on capital gains. If a company owns more than 25% of a company in another MS then double taxation of dividends has been abolished and withholding taxes are prohibited.	Low	Sales & distribution (unlikely to have significantly changed companies' incentives to engage in cross-border mergers)	Both
VAT	92/77/EEC	Large traders have to provide detailed information on intra-Community sales and purchases. VAT payments are no longer made at the frontier, but on domestic VAT returns. Traders can store any goods from outside the EC in tax warehouses and only pay VAT when they are released from the warehouse. There are simplifications on triangulation procedures. There have been moves to approximate VAT rates across Europe, with a minimum of 15% standard rate.	Medium	Sales & distribution (affects the end price to the consumer and therefore the demand for the vehicle)	CVs (purch-asers usually claim back VAT)
Customs duties	1991 PTAs with Cz, Hu and Pol. 2913/92 and 2454/93; 717/91 (21.3.91) are the main developments	Agreements with Eastern Europe to progressively liberalize trade. Creation of EEA has increased number of countries operating free markets for European products.	Medium	Manufacturing, Sales & distribution (affected the costs of importing vehicles from Eastern Europe and may have facilitated inward investment into Europe)	Both

Title	Measure	Description	Influence (initial view)	Focus	Cars or CVs
Excise duties	92/82/EEC	Directive sets minimum rates of excise duty on mineral oils, including petrol and diesel	Low	Sales & distribution (affects the total cost of running a vehicle)	Both
Non-mandated standards	Various	Development of ISO 9000 standards. Removal of standards other than health, safety, consumer protection and environment as barriers to trade except where previous legislation exists and attempts to converge standards allow rationalization of manufacturing processes and promote competition (see sectoral legislation). Testing and certification bodies are to be brought up to EN45000 standards with a view to mutual recognition of these bodies.	Medium	Manufacturing	
Financial services	88/361/EEC; 90/619/EEC (8.11.90); 92/96/EEC (10.11.92); 88/357/EEC (22.6.88) 90/232/EEC (14.5.90)	Insurance companies can set up branches and offer services in any MS under single licence. There are provisions to encourage further competition in the life assurance and pensions market.	Low	Sales & distribution	Both
		Exchange controls have been abolished and by the end of 1992 Spain, Ireland and Portugal removed their existing controls. Harmonization of car insurance requirements.		Production	
EMU	Treaty on European Union	Treaty on European Union sets a date of 1 January 1999 for the introduction of a single currency.	High	Sales & distribution, manufacturing (lack of adoption has high (negative) effect and the industry has reacted to the uncertainty by spreading plants around Europe)	Both
Competition policy	Articles85/86 123/85	Article 85 of Treaty of Rome prohibits agreements between firms which distort, prevent or restrict competition. Exemptions for the automotive sector. Joint ventures are subject to supervision. Merger Control Regulation (1990) prohibits mergers which create or reinforce a dominant position. State aid granted illegally can be challenged retroactively by the Commission and may have to be repaid. Car distribution has a block exemption from Articles 85 and 86.	High	Sales & distribution (probably affected final prices to consumers)	Both
State aids	Articles 92, 93 and 94	Ensures that removal of barriers to trade is not negated by Member States protecting their industries through unjustified subsidies or other forms of support which distort fair competition.	Medium	Finance & sales, distribution	Both
Company law	Fourth and Seventh Company Law Directives. 2137/85 (21.7.85) COM(91) 174/I and II	Common standards for the presentation of company reports and accounts. Ability to set up European Economic Interest Groups for ancillary activities. Proposals to impose restrictions on take-over and other general bid procedures and to provide for the creation of a European Company.	Low	Finance	Both

Title	Measure	Description	Influence (initial view)	Focus	Cars or CVs
Intellectual property	91/250/EEC; 89/104/EEC; 40/94 (20.12.93)	Number of copyright directives in specific areas such as software which harmonize national laws. Prohibition of the release for free circulation of counterfeit goods. Future changes in the procedures for patenting and trade mark protection (trade mark regulation already adopted; regulation on patents to come at an unspecified time) will reduce the costs of protecting intellectual property. Introduction of a Community trade mark applicable throughout the Community. Manufacturers of cars have recently not been provided with the copyright over the whole car and its spare parts (French court case against Italian parts copiers).	Medium	RD&D and suppliers (profits affected because parts market opening up to increased competition)	Both
Telecomm-unications	90/387/EEC (28.6.90); 92/44/EEC (5.6.92); 91/396/EEC (29.7.91); 92/264/EEC (11.5.92)	Harmonized international codes and emergency numbers. Harmonized frequency bands for mobile phones. Increased competition through opening up national networks.	Low	Manufacturing and suppliers	Both
Frontier controls	Regulation (EEC) No 3648/91; Regulation (EEC) No 717/91	Use of Single Administrative Document and subsequently the abolition of border controls.	High	Sales and distribution	Both

APPENDIX D

Fiscal regime

There has been some success in achieving VAT convergence. The Commission has now achieved its interim solution and whilst there is no full approximation, the spread of VAT rates has been reduced. In 1987 rates for cars varied between 38% (Italy) to 6% (Greece). All rates have now converged to the 15–25% range. However, we heard doubts expressed as to whether the proposed definitive VAT arrangement would occur by 1 January 1997, as scheduled.

Differences in car acquisition taxes are a more important factor in continuing international price discrepancies as well as differences in car ownership. These differences are shown in the tables below.

Differences in classification for the purposes of taxation have a significant effect on the segmentation of the car market.

Differences in tax treatment of company cars means that the market is distorted towards demand for larger segments and more highly specified cars (i.e. with additional features such as powered sunroofs).

Table D.1. VAT on new cars in EU Member States, 1987 and 1994

Country	1987 %	1994 %
Austria	-	20.0
Belgium	25.0	20.5
up to 3 litres or 116 kW	33.0	20.5[1]
over 3 litres or 116 kW	22.0	25.0
Denmark	-	22.0
Finland	28.0[2]	18.6[3]
France	14.0	15.0
Germany	6.0	18.0[4]
Greece	23.0	21.0
Ireland	18.0	19.0
Italy	18.0	19.0
up to 2 litres, petrol	38.0	19.0
up to 2.5 litres, diesel	38.0	19.0
over 2 litres, petrol	12.0	15.0
over 2.5 litres, diesel	20.0	17.5
Luxembourg	16.0	16.0
Netherlands	33.0	15.0
Portugal	-	25.0
Spain	15.0	17.5
Sweden		
UK	15.0	17.5

Source: EIU, *The New Car Market in Europe*, 1995.

[1] A standard 19.5% VAT was introduced in April 1992 and increased to 20.5% on 1 January 1994.
[2] Reduced from 33.3% in September 1987.
[3] Reduced to this level in April 1992, after having fallen to 25% in 1989 and 22% in 1990.
[4] Increased to this level (which is the standard rate of VAT in Greece) in August 1992.

Table D.2. Taxes on acquisition

Country	VAT (%)	Sales tax		Registration charge
		Passenger cars	Commercial vehicles	
Belgium	20.5	based on cc+age	none	BFR 2,500
Denmark	25	105% up to DKR 24400 180% on the remainder taxable value=price inc. VAT	95%	DKR 1,000
Germany	15	none	none	DM 54
Spain	16	12%	none	PTA 8,650
France	18.6	none	none	FF 88–160 & parafiscal charge
Greece	18	new car: 10–75%	new vehicle: 0–30%	8–16%
Ireland	21	<2.5 litres: 23.2% >2.5 litres: 29.5%	13.3% for LCV; otherwise £40–100	
Italy	19	>21 HP (petrol) or 24 HP (diesel) LIT 5–12 million (abolished 31.12.94)	transfer taxes	New: LIT 230,000 Used: LIT 210,000
Luxembourg	15	none	none	LFR 1,128
Netherlands	17.5	petrol car: 45.2%–HFL 3,394 diesel car: 45.2%–HFL 1,278	none	22–93.25 HFL
Portugal	16	based on cc e.g. 1801: ESC 1,327,776	none	ESC 5,000
UK	17.5	none	none	
Austria	20	based on fuel consumption 7–14%	none	
Finland	22	100%	none	
Sweden	25	excise tax based on pollution	excise tax	

Source: ACEA.

Table D.3. Taxes on ownership

Country	Sales tax		Registration charge
	Passenger cars	Commercial vehicles	
Belgium	based on cc+supplement	deadweight	number of private km
Denmark	weight	weight	car value
Germany	cc	total weight pollution, noise category	purchase price
Spain	HP	weight	acquisition cost
France	cc+age+district	cc+age+district	-
Greece	DR 15,000–50,000	DR 12.5/kg + parafiscal charge, unladen weight	-
Ireland	cc	payload	purchase price
Italy	cc+diesel, methane or LPG surtaxes	unladen weight	
Luxembourg	cc	deadweight and fuel	-
Netherlands	deadweight, province, fuel	weight and operating zone	list price
Portugal	cc+age	laden weight, HP	none
UK	UK £135	weight	purchase price+cc+age
Austria	HP	weight, axles, fuel	-
Finland	weight		-
Sweden	weight		-

Source: ACEA.

Table D.4. Taxes on motoring

Country	Excise duties on fuels (excl. VAT) in ECU/ 1,000litre				Tax on the insurance premium (%)
	Leaded	Unleaded	Diesel	LPG	
Belgium	497	427	298		27
Denmark	416	387	290	177	50 (< 6 tonnes) 25 (> 6 tonnes)
Germany	566	513	324		12
Spain	386	355	257		
France	587	547	328		35
Greece	402	351	243		19.6
Ireland	377	345	297		
Italy	512	458	339		13.5
Luxembourg	410	357	255	55	4
Netherlands	588	524	316	8	
Portugal	478	442	315		
UK	460	399	399		
Austria		350	259		
Finland		467	285		
Sweden		438	265		

Source: ACEA.

APPENDIX E

Drivers for change in the European automotive industry

The European automotive industry is, of course, not just composed of European-owned manufacturers. Neither is it confined to the European market. Hence, many of the drivers noted below are global in character – indeed globalization is one of the most important features of the industry.

E.1. Globalization

E.1.1. Interpenetration of markets

Since the early 1970s Japanese exports of complete vehicles to North America and Europe have constituted the major trade flows. Lesser trade flows consisted of flows from Europe to North America, Africa and South America; and Japan to South-East Asia. More recently this pattern has begun to change in the light of Japanese FDI, rising domestic production costs in Japan, the arrival of new players and the impact of Japanese transplants in Europe and the US. Thus, today, trade flows from Japan to North America are reducing, and those to Europe are static under the general agreement to limit exports until 1999. Growth in exports to Europe and North America is evident from Korea. European manufacturers are winning back some of the loss of market share endured in North America. Exports from the US, including those of the domestic manufacturers and those of Japanese transplants, are beginning to make an impact in Europe. Some Japanese transplant production is shipped back to Japan, while small inroads have been made by importers into Japan. Korea remains a closed market. At the European national level, domestic 'national champions' are effectively losing dominant market share and seeking to compensate by exports to other countries.

Summary: Europeans face even more competitive markets, especially within Europe itself.

E.1.2. Spatial extension of production

Most notable here has been the Japanese transplants in North America and Europe. Growth in transplant capacity is slowing down, especially in North America. New Japanese capacity in Europe will be c. 2 million units by the year 2000. Still the most globally organized companies remain GM and Ford.

There is growth in European capacity in the 'EU periphery' (i.e. Portugal, southern Italy, Burneston), former East Germany, etc. and also growth just outside Europe, for example, Fiat in Poland. Growth is much less in traditional industry heartlands, though reinvestment is occurring (Jaguar, Ford Dagenham, Renault Flins) and few closures have been announced.

There is a new trend to local production by European companies in North America. For example, Mercedes and BMW have new plants there. This may be the start of reversing the trend for Europeans to exit the North American market.

There is little European production capacity in South-East Asia, but growth is expected in China – exports to or production in China is difficult to predict because of the political

dimension, sudden shifts in policy can and do occur. There is a perceived danger of protection in these markets, particularly in China.

There is a trend for developing countries to purchase production line processes. For example, parts of the production line for Rover's Montego car have been sold to India.

Summary: FDI flows reflect the need to develop a broadly-based portfolio of production locations.

E.1.3. Pan-national alliances

Production alliances are a feature of the industry, as are various marketing or 'badge engineering' agreements, e.g. the Ford Terrano is actually a Nissan vehicle. Alliances in general can be seen as a means of virtual integration or partial integration – achieving the benefits of scale without the costs of integration. The failure of the Renault–Volvo merger is indicative of the political difficulties in rationalization of the European industry.

At a global scale there is an emerging 'clustering' of companies around a few leaders, i.e.:

GM	Opel, Vauxhall, Isuzu, Saab
Ford	Mazda, Kia, Jaguar, Aston Martin, IVECO
Toyota	Hino, etc. in Keiretsu
Nissan	Nissan Diesel, etc.
VW	Seat, Audi, Skoda (but quite European in focus)
Mitsubishi	Proton (Malaysia), links with Mercedes, Nedcar

These may be short-term moves to experiment in different markets or product lines.

Summary: Some European firms (Renault, PSA, Volvo, Fiat) appear largely outside the major groupings, and are potentially vulnerable.

E.2. Global currency movements

The inexorable rise of the Yen has pushed up the market prices for Japanese cars, and is an important element both in further attempts at efficiency improvement within Japan, and in globalization of production.

Equally, the strength of the German Mark is undoubtedly a factor in the long-term movement of productive capital out of Germany.

Summary: Currency movements are a vital factor in long-term competitiveness. They underpin and support globalization of production and sourcing.

E.3. Overcapacity

Capacity is a moving target, in that available capacity may increase without new plant investment as a result of improvements in productivity within existing plant. Capacity is also relative to demand. The extent to which capacity of specific models or types of vehicle can be changed is also of importance. In the USA, for example, Ford and GM are busy converting plant which made large saloons into plant to make pick-up trucks. This takes time and money.

In Europe there appears to be an overall surplus of capacity of around 20% relative to average demand – though in practice this is common.

US industry has typically been very cyclical, with assembly capacity structured so as to maximize output at the top of the cycle – there is nothing worse for a manufacturer to have demand for the product and be unable to supply it. Japanese industry, until the recent downturn, did not show similar cyclical swings, so capacity could be developed to more accurately match demand. Additionally, leading assemblers such as Toyota can access capacity at sister companies (Toyota has always produced more vehicles than apparent capacity).

Europe faces an emerging overcapacity in small sports cars, 4 wheel drive vehicles, standard saloons and Espace-type people carriers. Much new capacity has been added in Europe (mainly with subsidies), but relatively little taken away; this cannot continue.

Summary: New capacity offers state-of-the-art productivity – but somewhere the system has to give. Traditional European producers and locations are most at risk.

E.4. Market conditions

E.4.1. Demand in Europe

As noted above, capacity is relative to demand. In Europe demand has stagnated since 1991/92, and unusually appears to have done so broadly across all markets at the same time – an ominous portent for European industry which could previously offset declines in one national market with growth in another.

European demand for either cars or trucks is mature and is unlikely to experience significant upward growth. Even if overall economic conditions improve, Europe cannot absorb any more cars, and increasingly measures are being introduced at all governmental levels which will restrict car usage.

European market share in Europe (including US companies) is under threat from the Japanese (unrestricted access after 1999) and the Koreans (no restrictions).

Summary: More competitive sales environment.

E.4.2. North America

North America is a vital market for European built high value cars (Volvo, Mercedes, BMW, Jaguar, Porsche, Ferrari, Rolls Royce, etc.). However, European firms suffered a catastrophic fall in sales over the period 1986–93. There has been some recovery since then, but Japanese firms have taken a strong hold over the luxury car segment, epitomized by the Lexus LS400.

North America can take over 50% of the sales of the above companies, and of the output of more specialized products, such as the new MGF (Rover Group). It is not surprising therefore that US safety and emissions standards have been a bigger driver than European standards for these companies (e.g. high level brake lights).

Summary: Some recovery, but Europe needs to succeed in the USA.

Summary: Chronic lack of profitability increases pressure on weaker firms in all parts of the industry.

E.4.3. Japan and South-East Asia

European firms have a very small share in these markets, which are either almost closed (South Korea), non-existent (Myanmar) or dominated by Japanese products (Malaysia, Thailand, Australia, Taiwan, etc.). There are often high growth markets in smaller developing countries. There is a long-term weakness for European industry in this region, especially in the market in Japan itself. Some recent progress has been made here, but from a very low base.

E.4.4. Others

Growth of sales in Eastern Europe has been disappointing; change will happen a lot more slowly than some optimists first suggested. South America has consistently failed to live up to expectations, but new growth in sales is occurring in the key markets of Brazil and Argentina, where European firms (Fiat, VW) are reasonably placed.

Summary: European firms need to find new markets outside Europe, but it is going to be difficult.

E.5. Low returns

In 1993 GM recorded the biggest corporate loss in history. Long-term profit trends in the industry show low returns, getting even lower, with highly cyclical swings. GM strategy is now to make as much in the good times as possible, in order to see through the next downsizing.

In Europe, in the last 30 years only BMW has been consistently profitable. Others have been consistently unprofitable, or of marginal profitability. This is a major long-term structural problem, as profits are needed to develop new models, etc. Cash is frequently raised on financial markets.

Some companies are better placed. Volvo has assets following its strategy of selling non-core businesses; BMW has substantial cash reserves. Individual or family ownership is still important in the cases of Fiat (Agnelli), BMW (Quant), PSA (Peugeot), and Porsche (Piech). The French state still controls Renault, although this could be privatized in due course. Low returns are endemic, from component suppliers to dealers – again the implication is that in the long run something has to give. What happens to profits is equally important. Japanese firms have low levels of profit, but most is reinvested rather than paid out to shareholders.

E.6. Standards and governmental regulation

E.6.1. Europe

Meeting EU safety and emissions standards is a prerequisite, but harmonization should lower costs. European legislation is slow; national measures (e.g. incentives to introduce catalysts) prior to European harmonization were allowed, but national measures can fall foul of European measures. Europe tends to lag behind the USA on regulation issues, so in this sense EU regulation is less of a driver.

However, standards are set to rise in terms of emissions, having gone through Euro-1 and Euro-2. This is expensive, but at least predictable for manufacturers. However, it means engines (which typically are kept in production for much longer than bodies) are more liable to be rendered obsolete.

Note that harmonization of standards is much less complete in the commercial vehicle industry. Partly this is a reflection of the fragmentation of demand, with many customized applications built onto volume produced chassis. Basic terms, such as allowed total weight, height and width, vary across national markets.

Summary: Regulation of product and process (CFCs, hydro-soluble paints, landfill) dominates the design process.

E.6.2. USA

The picture in the USA is somewhat confusing. Essentially, California has led the way on emissions, but the Big 3 are fighting hard for alternative standards to be adopted elsewhere. Some states want to follow California.

Safety and fuel economy (CAFE) are monitored by the national government. If European manufacturers intend to sell into North America, they have to adopt US standards. US air bags are bigger than in Europe: GM fits them in its European cars, Ford does not.

Truck regulations in the USA are again different to those in Europe, as are those in Japan. However, the European truck industry has a strong ownership presence in the North American market. Very different standards between these two markets may act to the detriment of European producers.

Summary: A lead in regulation has been established in California under increasing pressure, but manufacturers cannot assume the overall direction of regulation will change – ultimately radically new technologies will have to be introduced.

E.7. Trade

Established and emerging economic regions dominate the global structure – EU, NAFTA, Mercusor, etc. Notwithstanding the efforts of GATT/WTO, there is a concern to be within each region with the production facilities in order to access the markets.

Friction over trade, especially the surplus enjoyed by Japan with the EU and North America, is source of continuing political disagreement. Japan has sourced more components from North America and Europe to balance trade flows, but the net impact to date is still small.

Future trade disputes are likely to focus on Korea and, potentially, Japanese exports via North America. Growth in production in Eastern Europe may also be a problem (e.g. with Koreans entering).

E.8. Design

Many of the issues confronting vehicle manufacturers are distilled in vehicle design. European performance in terms of design time is below global best practice, as is design for manufacture and extent of supplier involvement.

Vehicle designers are using fewer platforms, more carry over parts, etc. in an effort to reduce design time and amortize costs over longer production runs while providing product differentiation (VAG are to use just four platforms for their entire group range). Europe continues to have strengths in the innovative character of design and the ability to style vehicles more effectively; the Twingo is a good recent example. Europe is less competitive in terms of the design process.

E.9. Production organization and processes

Europe continues to improve production organization and processes, but debate still continues over the wider social context within which production takes place. The difference between wages paid to staff and total labour costs can be large (e.g. Germany, Sweden) where social costs are high.

E.9.1. Assembly

Japanese transplants have achieved remarkable production performances, e.g. in hours to build a vehicle; in time to reach full production after introducing a new model; and in output in vehicles per employee. This has been partly through radical changes in work organization, teamworking, elimination of demarcations, etc.; especially in the UK, European industry is catching up. Elsewhere in Europe shift patterns, holidays, working time, etc., all vary widely – in many instances working time is less than in Japan or the USA.

Many of the European plants (including Ford and GM) are long-established, with poor layout and access. Newer plants (e.g. Fiat at Melfi) are much more competitive.

Summary: European plants must continue to improve productivity.

E.9.2. Supply chain management

As part of the total costs calculus for production, assemblers have sought to squeeze the supply base – in some cases pushing through absolute reductions in piece price (VW). Supply chain management is a vital part of competitive performance for manufacturers. Use of quality performance systems lacks integration (though harmonization of standards is occurring) and represents an added cost for suppliers and also a management cost for assemblers, which, in the medium term, it would be useful to do without. Few European assemblers have global purchasing capability (essentially GM and Ford, plus new Japanese transplants), or even well developed purchasing capability across Europe (e.g. Sogedac/PSA still buys largely in France and Spain).

Europe cannot simply copy Japanese practice in this area, especially with regard to logistics and JIT. Newer plants tend to have some key suppliers alongside, but note that this is not the case with Toyota at Burneston. European suppliers also underperform global best practice productivity and quality, but have a good record on innovation. Many have won business with Japanese transplants.

Summary: Fragmentation of assemblers is reflected in the supply base; performance is still below global best practice.

E.10. Government research initiatives and technology change

These can be national (e.g. UK-based IMI Programme) or pan-European (e.g. Prometheus, Drive, Eureka). Of particular importance is EUCAR, an umbrella grouping to co-ordinate the long-term technological development of the industry. These initiatives provide a mechanism to bring in suppliers and assemblers, reduce risk, share cost, and provide a clear direction for change. Similar major programmes are underway in the USA (USCAR, which excludes non-US firms) and Japan. Major concerns are: new vehicle design concepts and use concepts; innovative drivetrain technologies, e.g. fuel cells, gas-turbine hybrids, advanced batteries, innovative body materials; advanced telematics and vehicle navigation systems; and advanced urban traffic management systems.

More applications of electronics sensor and actuator technology are likely. Technological advances in other areas are important, too – especially telecoms/EDI which has a direct impact on the vehicle design process (networked CAD/CAM), purchasing (EDI) and vehicle sales and distribution (EDI).

Summary: The industry faces radical technological change and, therefore, high uncertainty and risk.

E.11. Environmental and other transport systems

Thus far, regulation has been very narrow. There are specific controls over processes or process materials (CFCs, water-based paints, consumption of energy or water) or over specific attributes of vehicles (occupant safety in a head-on impact; exhaust emissions). Regulation has also been slow and cautious (except Sweden, which is generally ahead of Europe on safety). More recent concerns are over landfill and the vehicle scrapping process. But a more deeply embedded environmental approach (which seems inevitable) will demand a more holistic attitude of looking at the costs of the entire life-cycle of vehicles – which will have a profound impact on materials, powertrain and vehicle longevity.

At a local level, many measures are being enacted which restrict vehicle use or make it more expensive, e.g. city centre bans, higher parking costs, road pricing, etc. This leads to questions on the need for transport at all, and secondly on the mode of transport. Light rail and other alternatives are being adopted more widely, cycling is being promoted, etc.

Summary: Vehicles may become less of a necessity, more of a leisure activity. Assemblers must be more sensitive to environmental concerns generally.

E.12. Demographics

Many European countries have ageing population profiles. In North America GM is crippled by health care costs. Overall, social costs are likely to rise, and will have to be carried by vehicle assemblers. Recruitment could become more of a problem, especially on the shop floor.

Car buyers are also ageing: the average new GM car buyer in the USA is almost retired! This impacts on vehicle design. Alternative forms of 'ownership' may have to be developed (e.g. Mercedes pool leasing scheme). Vehicles are likely to become more expensive in relative terms. European marketing costs are very high already, and some brands appear poorly placed to cope with radical changes in the market or the product.

APPENDIX F

Case studies

We have offered to carry out five case studies – Volvo, Nissan, Fiat, Renault and Daewoo.

F.1. Volvo

This company was chosen because it manufactures both automobiles and commercial vehicles. Also, as Sweden is a new EU member, it represents a new entrant into the market.

F.2. Nissan

Nissan is a Japanese manufacturer of both automobiles and commercial vehicles. It has a Spanish plant producing commercial vehicles. It set up production facilities in Europe in the mid-1980s, just before the single market programme. It would therefore be interesting to assess its reasons for doing this. It has successfully implemented some of the lean production techniques common to the industry in Japan.

F.3. Fiat

Fiat is an Italian producer of automobiles and commercial vehicles, traditionally having a very high share of its domestic market – more so than Renault or Peugeot/Citroën. Fiat has been under great pressure as a result of single market initiatives.

F.4. Renault

Renault is the third largest European assembler (after GM and Ford). It is interesting because of its high levels of sales outside its domestic French market and its developed relationships with suppliers. It has been active in seeking lower cost production bases, notably in the Americas.

F.5. Daewoo

Daewoo is a recent Korean entrant into the European marketplace. It has developed some very innovative distribution arrangements. It also offers the opportunity for us to review a recent foreign direct investment into Eastern Europe.

APPENDIX G

New registrations of passenger cars in Western Europe by manufacturer, 1989–94

(in units)

	1989	1990	1991	1992	1993	1994
Opel/GM Europe	1,471,991	1,497,408	1,551,738	1,611,406	1,415,552	1,475,042
Ford	1,561,261	1,508,866	1,591,919	1,505,183	1,292,490	1,391,439
Renault	1,388,459	1,298,166	1,344,526	1,426,993	1,186,898	1,296,674
Volkswagen	1,349,556	1,370,643	1,444,023	1,561,852	1,209,699	1,212,061
Fiat	1,475,977	1,367,302	1,251,047	1,192,057	894,177	1,015,583
Peugeot	1,050,629	1,075,853	1,014,357	991,174	835,899	914,808
Citroën	643,959	628,776	607,797	645,486	551,108	605,883
Mercedes-Benz	423,423	425,021	450,503	408,789	350,940	416,355
Nissan	404,105	393,927	451,773	449,908	408,648	403,335
BMW	375,564	360,581	411,780	440,502	365,303	386,370
Rover	393,049	361,764	325,440	306,835	328,832	354,529
Toyota	344,661	352,416	357,053	335,791	312,618	314,073
Audi	358,279	356,828	393,873	411,920	305,599	310,036
Seat	303,508	306,946	321,430	329,084	259,389	295,280
Volvo	265,103	232,087	198,259	200,232	171,551	199,743
Mazda	237,029	275,306	283,387	267,430	191,109	176,536
Honda	136,121	159,380	170,998	175,457	160,537	167,386
Lancia	293,942	299,215	270,697	228,487	163,284	162,720
Mitsubishi	163,846	172,876	191,674	162,051	137,886	121,380
Alfa Romeo	217,269	204,405	188,977	164,275	113,723	100,083
Hyundai	16,750	18,274	40,776	83,024	85,257	85,411
Suzuki	93,214	105,513	110,863	117,455	99,518	78,913
Chrysler	31,315	35,778	40,776	41,911	53,878	60,788
Skoda	32,036	24,821	47,774	51,293	51,232	56,717
Saab	65,979	57,190	52,030	50,535	42,271	51,626
Lada	114,072	98,300	111,057	99,260	52,062	40,428
Land Rover	20,326	30,987	28,869	29,352	35,040	39,364
Subaru	50,852	50,930	54,663	52,158	40,977	37,757
Daihatsu	41,321	40,322	53,689	45,879	33,613	24,312
Others	129,032	123,550	134,540	119,351	86,786	96,600
Total	13,452,628	13,233,431	13,496,288	13,505,130	11,235,876	11,891,232

APPENDIX H

Market share information

Table H.1. Market share information – volumes (%)

	1989	1990	1991	1992	1993	1994
Opel/GM Europe	10.9	11.3	1.5	11.9	12.6	12.4
Ford	11.6	11.4	11.8	11.1	11.5	11.7
Renault	10.3	9.8	10.0	10.6	10.6	10.9
Volkswagen	10.0	10.4	10.7	11.6	10.8	10.2
Fiat	11.0	10.3	9.3	8.8	8.0	8.5
Peugeot	7.8	8.1	7.5	7.3	7.4	7.7
Citroën	4.8	4.8	4.5	4.8	4.9	5.1
Mercedes-Benz	3.1	3.2	3.3	3.0	3.1	3.5
Nissan	3.0	3.0	3.3	3.3	3.6	3.4
BMW	2.8	2.7	3.1	3.3	3.3	3.2
Rover	2.9	2.7	2.4	2.3	2.9	3.0
Toyota	2.6	2.7	2.6	2.5	2.8	2.6
Audi	2.7	2.7	2.9	3.1	2.7	2.6
Seat	2.3	2.3	2.4	2.4	2.3	2.5
Volvo	2.0	1.8	1.5	1.5	1.5	1.7
Mazda	1.8	2.1	2.1	2.0	1.7	1.5
Honda	1.0	1.2	1.3	1.3	1.4	1.4
Lancia	2.2	2.3	2.0	1.7	1.5	1.4
Mitsubishi	1.2	1.3	1.4	1.2	1.2	1.0
Alfa Romeo	1.6	1.5	1.4	1.2	1.0	0.8
Hyundai	0.1	0.1	0.3	0.6	0.8	0.7
Suzuki	0.7	0.8	0.8	0.9	0.9	0.7
Chrysler	0.2	0.3	0.3	0.3	0.5	0.5
Skoda	0.2	0.2	0.4	0.4	0.5	0.5
Saab	0.5	0.4	0.4	0.4	0.4	0.4
Lada	0.8	0.7	0.8	0.7	0.5	0.3
Land Rover	0.2	0.2	0.2	0.2	0.3	0.3
Subaru	0.4	0.4	0.4	0.4	0.4	0.3
Daihatsu	0.3	0.3	0.4	0.3	0.3	0.2
Others	1.0	0.9	1.0	0.9	0.8	0.8
Total	100.0	100.0	100.0	100.0	100.0	100.0

Source: Economist Intelligence Unit 1995.

H.2. World market share by manufacturer HQ, passenger cars, 1982–93

	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Europe	**37.14**	**35.54**	**33.20**	**32.84**	**33.67**	**35.25**	**34.83**	**34.29**	**33.71**	**34.02**	**34.16**	**31.30**
America	33.69	36.04	38.89	38.13	36.94	33.35	33.11	31.09	28.75	27.54	27.43	30.24
Japan	26.17	25.69	24.88	25.74	25.47	26.27	26.61	29.45	32.01	32.49	31.89	30.83
Korea	0.40	0.42	0.52	0.83	1.37	2.37	2.46	2.47	2.76	3.33	3.82	4.74
Others	2.60	2.32	2.51	2.47	2.54	2.77	2.99	2.71	2.77	2.63	2.70	2.90

Source: Ward's 1994. Table 23 p26.

H.3. World market share (%) by marque and group, passenger cars, 1984–93

	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Alfa	0.65	0.54	0.55	0.58	0.62	0.61	0.57	0.55	0.45	0.37
Audi	1.14	1.10	1.06	1.22	1.16	1.11	1.17	1.29	1.36	1.07
BMW	1.40	1.39	1.33	1.37	1.35	1.40	1.40	1.54	1.67	1.59
Citroën	1.59	1.58	1.60	1.95	2.00	2.02	1.95	1.99	1.96	1.88
Fiat	3.81	3.65	3.96	4.14	4.27	4.29	3.99	3.90	3.77	3.48
Jaguar	0.10	0.11	0.12	0.14	0.13	0.13	0.11	0.07	0.06	0.08
Lancia	0.62	0.66	0.68	0.77	0.75	0.81	0.80	0.63	0.53	0.51
Mercedes	1.67	1.72	1.81	1.81	1.68	1.59	1.58	1.63	1.50	1.40
Peugeot	3.17	2.98	3.12	3.25	3.40	3.40	3.53	3.30	3.37	3.11
Renault	5.00	4.62	4.55	4.73	4.43	4.54	4.19	4.49	4.83	4.54
Rover	1.32	1.46	1.24	1.42	1.35	1.29	1.26	1.11	1.06	1.21
Saab	0.33	0.35	0.38	0.40	0.34	0.29	0.24	0.23	0.24	0.20
Seat	0.65	0.63	0.63	0.76	0.85	0.90	0.88	0.94	0.92	0.78
Volvo	1.23	1.27	1.24	1.29	1.42	1.42	1.25	0.98	0.84	0.96
VW	5.41	5.94	6.67	6.37	6.15	6.20	6.37	6.66	6.86	6.20
Others	1.88	1.81	1.73	2.05	2.15	1.52	1.71	1.94	1.84	1.43
European	33.20	32.84	33.67	35.25	34.83	34.29	33.71	34.02	34.16	31.30
EU	**29.99**	**29.77**	**30.67**	**32.26**	**32.04**	**31.52**	**31.02**	**31.44**	**31.36**	**28.80**
American	38.89	38.13	36.94	33.35	33.11	31.09	26.75	27.54	27.43	30.24
Japanese	24.88	25.74	25.47	26.27	26.61	29.45	32.01	32.49	31.89	30.83
Korean	0.52	0.83	1.37	2.37	2.46	2.47	2.76	3.33	3.82	4.74
Fiat Group	5.08	4.86	5.19	5.49	5.65	5.72	5.38	5.25	4.85	4.37
PSA Group	**4.77**	**4.56**	**4.71**	**5.19**	**5.40**	**5.42**	**5.48**	**5.29**	**5.32**	**4.97**

	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
VAG	7.20	7.67	8.36	8.36	8.16	8.21	8.42	8.90	9.14	8.06
EU-7 average	**4.28**	**4.25**	**4.38**	**4.61**	**4.58**	**4.50**	**4.43**	**4.49**	**4.48**	**4.11**
EU-12 average	**2.50**	**2.48**	**2.56**	**2.69**	**2.67**	**2.62**	**2.58**	**2.62**	**2.61**	**2.40**
Idealized 7	**4.50**					**5.00**				**4.00**
Idealized 12	**2.50**					**3.00**				**2.50**

Source: Ward's 1994, p. 70.
Notes: European total includes Skoda and Lada.
Changes in ownership over the time period.
EU-7 average = PSA+VAG+Renault+Fiat Group+BMW+Mercedes+Rover.
EU-12 average = Peugeot+Citroën+Renault+VW+Audi+Fiat+Lancia+Alfa Romeo+Mercedes+BMW+Rover+Seat

Table H.4. Domestic sales as a proportion (%) of total global passenger car sales, 1984–93

	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Fiat (Gp)	65.04	65.97	63.29	64.29	65.32	65.06	62.24	58.21	59.89	56.75
PSA	**40.04**	**41.98**	**39.00**	**40.52**	**39.53**	**37.90**	**37.99**	**35.83**	**33.62**	**30.52**
VAG	30.64	27.88	29.23	31.22	28.52	26.87	26.48	34.90	34.52	32.98
Renault	35.70	34.36	39.72	40.55	40.92	40.05	41.53	33.75	35.94	34.46
Average 4	**42.00**	**42.00**	**42.00**	**44.00**	**43.00**	**42.00**	**41.00**	**40.00**	**40.00**	**38.00**
Alfa	60.15	65.37	60.76	60.06	64.23	64.55	62.16	58.27	66.51	64.70
Audi	41.30	37.05	42.73	51.63	45.63	39.23	38.87	48.92	48.00	47.05
Citroën	46.10	44.86	41.88	40.41	37.48	37.14	37.19	33.77	33.32	31.29
BMW	37.31	32.52	33.33	32.61	37.69	37.64	37.08	42.15	40.87	37.90
Fiat	64.31	63.86	61.96	62.48	63.05	62.48	59.68	54.73	56.26	52.77
Lancia	74.66	77.97	77.18	77.27	79.16	79.10	74.75	75.09	76.89	77.43
Mercedes	45.74	49.57	50.28	47.72	47.36	44.89	44.97	50.09	47.90	46.42
Peugeot	37.00	40.45	37.53	40.59	40.74	38.35	38.43	36.75	33.79	30.06
Rover	77.48	70.39	71.81	63.60	69.68	66.70	60.53	57.75	56.72	58.57
Saab	29.02	24.00	23.16	22.52	22.47	24.90	21.97	22.03	16.42	18.50
Seat	41.47	32.12	36.99	40.36	36.14	34.69	30.31	26.84	29.61	29.79
VW	31.76	28.91	29.60	30.55	28.55	27.50	28.02	33.13	33.17	31.87
Volvo	16.66	18.01	15.65	16.80	14.82	12.87	10.33	10.81	11.94	10.25
Average 12	**49.40**	**48.00**	**48.60**	**48.80**	**49.10**	**47.60**	**46.00**	**45.80**	**56.50**	**45.10**
Idealized	**50.00**									**45.00**

Source: Ward's 1994. Compiled from various tables.

Table H.5. EU sales as a proportion (%) of total sales, 1984–93

	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Fiat (Gp)	90.86	89.94	89.98	92.46	93.27	93.23	91.97	89.80	89.47	83.19
PSA	**76.52**	**80.21**	**80.22**	**82.87**	**83.67**	**82.43**	**81.24**	**82.94**	**83.49**	**80.46**
VAG	56.62	55.28	54.90	60.70	61.25	62.11	60.88	63.71	65.84	62.67
Renault	70.86	74.57	78.74	80.82	81.51	82.15	82.00	81.81	80.00	75.53
Average 4	**73.72**	**75.00**	**75.96**	**79.21**	**79.93**	**79.98**	**79.02**	**79.57**	**79.69**	**75.46**
Alfa	85.95	87.91	87.36	91.04	92.88	92.22	92.06	92.38	93.10	93.16
Audi	66.26	62.80	67.19	76.49	80.07	79.60	75.25	77.47	76.90	80.70
Citroën	93.04	91.40	90.93	85.36	84.05	84.42	84.45	82.77	89.87	85.22
BMW	64.52	59.09	60.75	58.85	67.07	68.75	65.20	70.25	69.65	65.40
Fiat	90.95	89.32	89.42	91.94	92.70	92.62	90.96	87.86	87.75	80.05
Lancia	95.53	95.00	95.35	96.35	96.83	97.17	96.78	97.44	97.20	96.94
Mercedes	60.69	66.14	66.78	66.64	68.49	69.48	68.63	73.28	72.75	70.30
Peugeot	68.22	74.27	74.74	81.38	83.45	81.26	79.46	83.04	79.79	77.61
Rover	97.50	89.44	98.02	87.14	93.02	87.42	83.30	98.13	88.65	88.54
Saab	22.32	19.12	21.68	21.32	24.49	30.37	35.24	35.04	38.04	38.14
Seat	73.46	69.86	81.95	92.80	88.76	90.53	92.04	93.70	97.36	94.89
VW	52.57	52.35	50.40	53.83	53.91	54.85	53.93	56.79	59.40	55.48
Volvo	63.66	64.73	64.87	62.02	53.11	51.40	50.55	56.71	65.95	53.30
Average 7	**79.31**	**73.52**	**75.62**	**75.64**	**78.32**	**77.93**	**80.53**	**79.99**	**78.56**	**75.15**
Idealized	**75.00**					**80.00**			**75.00**	
Ford	31.19	29.13	30.83	33.64	31.37	33.61	35.77	40.52	37.89	32.42
GM	15.57	15.95	16.83	20.51	20.61	23.58	24.93	28.12	29.06	25.26
Nissan	12.17	12.37	14.76	14.48	15.19	13.93	13.58	15.97	17.05	17.89
Toyota	6.69	7.41	8.61	8.61	7.68	7.06	6.88	7.63	7.21	7.68
Japanese	10.61	10.51	12.29	12.25	11.58	10.41	10.37	11.72	11.42	11.28

Source: Ward's 1994, various tables.

Table H.6. Shares of the EU market (%), passenger cars, 1984–93

	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Alfa	1.85	1.59	1.53	1.57	1.74	1.67	1.58	1.44	1.20	1.07
Audi	2.50	2.30	2.26	2.77	2.78	2.61	2.66	2.85	2.97	2.73
BMW	2.98	2.74	2.57	2.38	2.71	2.83	2.75	3.08	3.30	3.28
Citroën	4.89	4.83	4.61	4.92	5.03	5.04	4.97	4.69	4.98	5.01
Fiat	11.43	10.91	11.23	11.28	11.87	11.72	10.94	9.75	9.37	8.80
Lancia	1.95	2.10	2.06	2.20	2.17	2.34	2.40	2.23	1.73	1.62
Mercedes	3.36	3.81	3.83	3.58	3.44	3.26	3.27	3.40	3.09	3.11
Peugeot	7.15	7.39	7.40	7.83	8.51	8.14	8.45	7.79	7.61	7.62
Renault	11.91	11.51	11.38	11.34	10.81	11.01	10.36	10.44	10.95	10.84
Rover	4.25	4.35	3.87	3.67	3.75	3.32	3.18	2.82	2.87	3.38
Saab	0.25	0.22	0.26	0.25	0.25	0.26	0.26	0.23	0.26	0.24
Seat	1.57	1.47	1.64	2.10	2.26	2.40	2.45	2.51	2.54	2.35
VW	9.39	10.39	10.68	10.17	9.93	10.03	10.36	10.78	11.55	10.87
Volvo	1.65	1.63	1.65	1.50	1.45	1.45	1.36	1.15	1.15	1.17
Total EUR	**67.17**	**67.57**	**67.29**	**67.59**	**68.56**	**67.86**	**66.65**	**64.96**	**65.61**	**63.64**
Average 7	**9.59**	**9.65**	**9.61**	**9.65**	**9.79**	**9.69**	**9.52**	**9.28**	**9.37**	**9.09**
Average 12	**5.59**	**5.63**	**5.60**	**5.63**	**5.71**	**5.65**	**5.54**	**5.41**	**5.46**	**5.30**
Ford	13.05	12.10	11.81	12.16	11.53	11.90	11.71	12.06	11.30	11.60
GM	10.95	11.22	10.87	10.57	10.44	10.93	11.34	11.63	11.90	12.63
Total US	24.01	23.32	22.68	22.72	22.03	22.96	23.21	23.92	23.45	24.62
Nissan	2.60	2.62	2.72	2.62	2.64	2.84	2.64	3.00	3.07	3.36
Toyota	1.83	2.07	2.30	2.18	2.04	1.97	2.17	2.23	2.12	2.42
Total Japan	8.72	9.04	9.93	9.54	9.23	9.04	10.02	10.82	10.31	10.99
Korean	0.10	0.07	0.10	0.15	0.17	0.14	0.13	0.29	0.63	0.75
Fiat Gp	15.24	14.59	14.82	15.05	15.78	15.72	14.92	13.42	12.30	11.49
PSA	**12.05**	**12.22**	**12.00**	**12.76**	**13.54**	**13.18**	**13.42**	**12.48**	**12.60**	**12.63**
VAG	13.47	14.17	14.58	15.04	14.96	15.03	15.47	16.12	17.06	15.96
Idealized	**12.00**									**12.00**

Source: Ward's 1994, p. 72.

Table H.7. Domestic market share (%), passenger cars, 1984–93

	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Alfa	7.33	6.47	6.14	5.91	6.51	6.09	5.55	4.87	4.55	4.21
Audi	6.01	5.47	5.33	7.23	6.67	5.58	5.51	5.43	5.70	5.32
BMW	6.66	6.06	5.22	5.11	6.43	6.74	6.27	5.58	6.22	6.34
Citroën	12.75	12.84	11.65	12.48	11.99	12.01	11.56	11.81	11.06	11.38
Fiat	45.70	42.79	44.76	43.72	43.76	41.18	37.26	32.56	31.90	32.69
Lancia	8.61	9.47	9.60	10.07	9.64	9.91	9.61	9.22	7.26	7.29
Mercedes	9.76	11.50	10.71	9.93	10.04	9.17	8.60	7.02	6.52	8.85
Peugeot	20.39	21.82	20.42	20.93	22.18	20.82	21.59	21.30	19.30	18.29
Renault	31.01	28.75	31.54	30.48	28.98	29.09	27.69	26.60	29.45	30.61
Rover	17.84	17.90	15.80	14.99	15.01	13.57	14.01	14.40	13.51	13.38
Saab	12.81	10.20	10.84	9.56	7.93	8.38	8.50	9.64	9.01	10.08
Seat	16.29	11.64	11.86	11.41	10.41	9.88	10.00	10.20	9.96	10.57
VW	21.89	23.11	23.28	22.33	22.18	21.86	20.04	18.97	20.69	20.83
Volvo	27.04	27.04	23.93	22.94	21.85	21.63	20.70	20.13	23.23	26.57
Fiat Gp	61.64	58.73	60.51	59.69	59.90	57.18	52.42	46.65	43.71	44.19
PSA	33.13	34.66	32.07	33.42	34.17	32.83	33.14	33.11	30.37	29.67
VAG	28.12	28.76	28.81	29.92	29.39	28.28	26.97	26.69	28.71	28.01

Source: Ward's 1994, various tables.
Note: Alfa, Lancia, Fiat, Fiat Group domestic market = Italy.
Peugeot, Citroën, PSA Group, Renault domestic market = France.
Seat domestic market = Spain.
VW, Audi, VAG domestic market = Germany.

Table H.8. Size of markets, passenger cars, major areas (millions), 1984-93

	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
EU	9.23	9.57	10.54	11.27	11.84	12.31	12.19	12.54	12.60	10.63
Western Europe	10.18	10.64	11.64	12.40	12.97	13.46	13.23	13.49	13.50	11.43
North America	11.50	12.34	12.65	11.40	11.83	11.03	10.53	9.41	9.45	9.65
Japan	3.09	3.10	3.14	3.27	3.71	4.40	5.10	4.86	4.95	4.19
World total	30.51	32.00	33.34	33.42	35.47	36.31	36.78	35.68	35.74	33.68

Source: Ward's 1994, various tables.

Table H.9. Size of markets, passenger cars (%), 1984–93

	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
EU	**30.27**	**29.93**	**31.51**	**33.73**	**33.38**	**33.90**	**33.14**	**35.16**	**35.27**	**31.65**
Western Europe	33.39	33.26	34.93	37.11	36.64	37.08	35.97	37.82	37.79	33.99
North America	37.71	38.60	37.95	34.12	33.39	30.40	28.64	26.45	26.46	28.68
Japan	10.15	9.70	9.44	9.80	10.48	12.13	13.87	13.64	12.46	12.47
World total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Table H.10. Multi-domestic sales as % of total global sales, PSA, 1984–93

	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
France	40.04	41.98	39.00	40.52	39.53	37.90	37.99	35.83	33.62	30.52
Spain	7.09	7.22	6.90	8.74	10.22	10.30	8.94	8.67	10.69	9.00
UK	6.54	6.95	7.70	8.48	10.11	10.43	9.16	8.75	9.91	13.26
Total	53.67	56.15	53.60	57.74	59.86	56.09	56.09	53.45	54.22	52.88

Source: Ward's 1994, various tables.

Table H.11. Multi-domestic sales as % of total global sales, Renault, 1984–93

	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
France	35.70	34.36	39.72	40.55	40.92	40.05	41.53	33.75	35.94	34.46
Spain	9.60	11.43	11.16	12.75	13.18	13.21	10.76	10.49	10.18	7.92
Belgium	2.00	2.32	2.24	2.26	2.29	2.67	3.20	2.61	2.65	2.81
Total	47.30	48.11	53.12	55.56	56.02	55.93	55.49	46.85	48.77	45.19

Source: Ward's 1994, various tables.

Table H.12. Multi-domestic market share (%), PSA, 1984–93

	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
France	33.13	34.66	32.07	33.42	34.17	32.83	33.14	33.11	30.37	29.67
Spain	20.48	18.96	16.53	16.81	18.67	17.70	18.47	20.76	20.24	
UK	5.52	5.67	6.12	5.77	5.88	6.00	6.23	6.05	5.74	5.21

Source: Ward's 1994, various tables.

Table H.13. Multi-domestic market share (%), Renault, 1984–93

	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
France	31.01	28.75	31.54	30.48	29.98	29.09	27.64	26.60	29.45	30.61
Spain	29.10	30.42	25.82	22.37	19.77	10.03	16.87	18.02	17.93	16.27
Belgium	8.25	9.05	8.32	8.53	8.43	10.01	10.38	9.06	9.81	11.45

Source: Ward's 1994, various tables.

Table H.14. Multi-domestic sales % of total global sales, Ford, 1984–93

	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Germany	7.60	6.41	7.38	7.39	6.47	6.54	7.50	11.42	9.73	7.91
UK	12.60	12.20	12.81	14.24	13.41	13.96	12.71	10.33	9.40	10.01
Spain	1.92	1.90	2.35	3.35	3.25	3.66	3.55	3.26	3.67	2.80
Belgium	0.91	0.84	0.89	0.99	0.98	1.03	1.04	1.16	1.16	0.93
Total	23.03	21.35	23.43	25.97	24.11	25.19	24.80	26.17	23.96	21.65

Source: Ward's 1994, various tables.

Table H.15. Multi-domestic sales % of total global sales, GM, 1984–93

	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Germany	5.99	5.46	6.21	7.82	7.17	8.01	9.46	13.81	12.75	10.04
UK	4.35	4.50	4.19	4.66	5.06	6.13	5.82	4.79	5.15	5.71
Spain	0.68	0.93	1.33	2.24	2.58	2.81	2.41	2.04	2.36	1.93
Belgium	0.67	0.71	0.70	0.82	0.84	0.86	1.06	1.03	0.96	0.78
Total	11.69	11.60	12.43	15.65	17.81	18.17	21.60	21.22	18.46	

Source: Ward's 1994, various tables.

Table H.16. Multi-domestic market share (%), Ford, 1984–93

	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Germany	12.27	10.72	10.50	10.32	10.04	10.07	9.85	10.27	9.31	9.45
UK	27.83	26.51	27.38	28.81	26.35	26.45	25.25	24.24	22.17	21.46
Spain	14.75	13.60	14.41	15.11	13.32	13.92	14.43	13.74	14.09	14.75
Belgium	9.44	12.87	11.67	11.37	11.75	11.16	12.35	11.61	10.66	11.07

Source: Ward's 1994, various tables.

Table H.17. Multi-domestic market share (%), GM, 1984–93

	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Germany	16.28	15.46	14.89	15.59	15.32	16.14	17.25	17.27	16.75	16.74
UK	16.71	16.56	15.11	13.45	13.70	15.21	16.08	15.62	16.70	17.09
Spain	8.75	11.23	13.80	14.45	14.79	14.02	13.63	11.97	12.44	13.84
Belgium	11.82	12.87	11.67	11.37	11.75	11.16	12.35	11.61	10.66	11.07

Source: Ward's 1994, various tables.

APPENDIX I

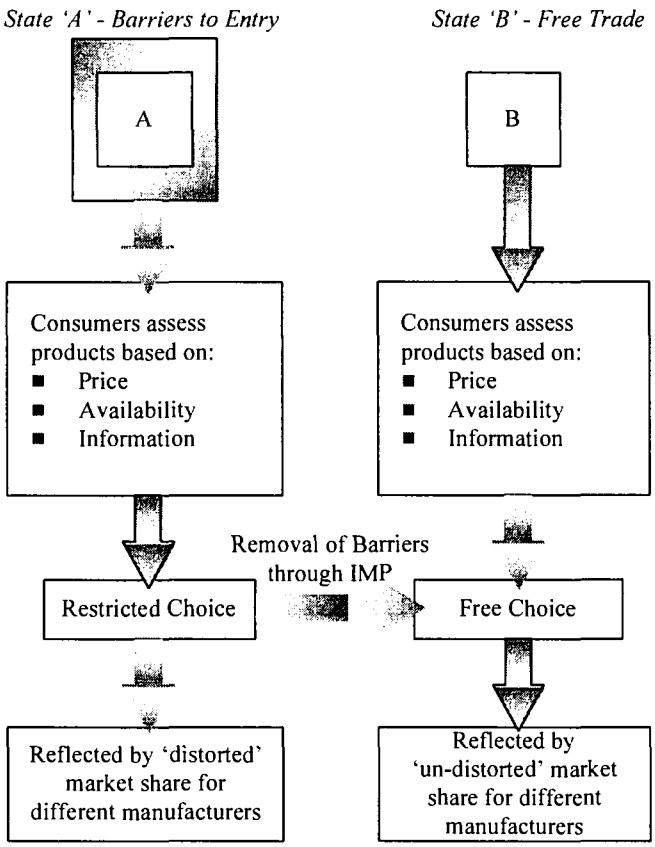
Market share equalization

Figure I.1 shows how market shares are affected by barriers to entry:

(a) State A is affected by various barriers to entry. Consumers in State A, as in State B, assess the value and quality of competing manufacturers' product.
(b) However, consumers in State A have their assessment distorted by the fact that the selection of product on offer and the price and information available about this product are distorted by the barriers to entry.
(c) In State B, the market share of each manufacturer acts as a true guide of the relative merits of each manufacturer's product, since consumers were able to make a fair and undistorted choice.
(d) The removal of these distortions in State A is expected to result in the market shares for manufacturers in State A and State B to tend towards each other.

The removal of barriers to trade means that consumers can decide which product to buy based on the same market conditions as everywhere else in Europe. As a result of this, the market shares in individual Member States should tend towards each other. In addition, analysis of imports and exports between EU Member States over time can illustrate whether the EU is becoming a single market.

Figure I.1. The impact of barriers to entry on manufacturers' market share



APPENDIX J

The Elzinga–Hogarty analysis

The Elzinga-Hogarty test[10] considers the extent to which sales in a region originate from outside that region or where the production from a region is exported. The extent to which sales in a region originate outside the region provides some indication as to the degree to which consumers are able to switch demand from local to non-local suppliers. This type of observation is useful in deciding whether domestic markets face significant competition from foreign suppliers.

Elzinga and Hogarty specify two criteria: 'little in from outside' (LIFO), meaning that imports into the region are small; and 'little out from inside' (LOFI), meaning that exports from the region are small. If either of these tests are failed, then there is a presumption towards including both regions in the same market. However, the Elzinga–Hogarty test is conservative in the sense that it determines the narrowest extent of the relevant market.

The data is organized in three steps:

(a) in the two areas under consideration, calculate the total sales of the firms under consideration (or in many cases, total production);
(b) in each area, calculate the total exports;
(c) calculate exports from each area excluding those exported to the other area under consideration.

The LIFO component of the definition reflects conditions on the buyers' side of the market, and can be expressed as follows:

$$\frac{\text{Production minus Exports}}{\text{Consumption}}$$

where consumption is production minus exports plus imports.

The LOFI component of the definition reflects conditions on the sellers' side of the market, and can be expressed as follows:

$$\frac{\text{Production minus Exports}}{\text{Production}}$$

The data required for this test, therefore, are:

(a) total production of automotive vehicles by Member State;
(b) total exports from each Member State (volume);
(c) details of which EU Member States are exported to and what the volume of exports to each of these states is.

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[10] Elzinga, K. and Hogarty, T., 'The problem of Geographic Market Definition in Antimerger Suits', Antitrust Bulletin, 1973.

APPENDIX K

Component supplier case studies

K.1. Tyres and the single market

K.1.2. Introduction

As part of our analysis of the effects of the single market programme on the automotive sector, we agreed to carry out three case studies on the effects of the type approval measures on the components supply sector. The following is the output of the first of these case studies, covering the supply of tyres.

Council Directive 92/23/EEC of 31 March 1992 on tyres for motor vehicles and trailers concerns the technical requirements for the construction and testing of tyres and the fitting of tyres to the vehicle. We have interviewed some of the major tyre manufacturers in Europe to assess how important this directive has been to their business in terms of administration, production costs and their European outlook. The companies interviewed were:

(a) Japanese tyre manufacturer with European presence;
(b) large European manufacturer No 1;
(c) UK tyre manufacturer;
(d) large European tyre manufacturer No 2.

The questions asked to each of these manufacturers covered:

(a) the cost of developing fewer variants of tyres across Europe;
(b) the production process changes (if any) as a result of this harmonization;
(c) the administrative cost savings as a result of not having to obtain type approval in separate countries;
(d) any further restrictions which are still apparent in this area, which the Commission should be aware of.

We have also spoken to the Commission to gain their opinion on the effect of type approval harmonization for tyres. This has helped to ensure that the case study results reported below are balanced with company interests countered by EC beliefs.

K.1.2. Summary

(a) The overall feeling is that the companies interviewed have been becoming more 'European' for at least the last ten years. This has greatly reduced the possible impact of the implementation of the Directive for tyre type approval.
(b) United Nations Economic Commission for Europe (UNECE) regulations have been in place for at least ten years. Adoption of these meant that the impact of the EEC Directive has been weakened further, since there is very little difference in the UN and EU regulations. Harmonization of type approval has already happened.
(c) The companies do feel that there has been a general easing in the trade processes and administration as a result of the SMP. This has led to a reduction in the requirements for

stock centres spread across Europe as trade and 'just-in-time' supply is more easy. However, production processes of the tyre manufacturers have not significantly changed.

(d) There do appear to be slight problems in the interpretation of the Directive by the different Member States. This has led, in some countries, to an increase in the paperwork required and a deterioration in the logistics of trade between the Member States.

(e) Other directives regarding the environmental impact of tyres have been felt to have had a significant impact on the way the tyre manufacturers operate. Directives regarding emissions from the production process and on-road efficiency of tyres are noted as having had an effect on the companies.

(f) Competition in Europe has been felt to have increased through the entry (via takeover) of Japanese companies with new manufacturing techniques and equipment. The adoption of these techniques by European companies has been a gradual process.

(g) The European Commission also felt that the tyre industry of Europe would not be greatly affected by the single market. The tyre companies were already treating Europe as a single market prior to the implementation of the programme, utilizing UN ECE regulations for type approval.

We present the results of our survey for each of the tyre manufacturers.

Japanese manufacturer with European presence

(a) There was a general feeling that even though the rules determining type approval across Europe have been harmonized, there are still problems caused by the interpretation of Member States legislative bodies of these rules resulting in an increase in paperwork necessary to gain type approval in some cases.

(b) One example of the problems caused by legislative differences is the French decision of January 1995 regarding the definition of category of tyre. Strict interpretation of this rule requires tyres of the same size, trade mark, manufacturer and tyre type to be fitted to the same axle of vehicles. Even if the same tyre is available from a different manufacturer, it cannot be fitted to that axle. The interpretation of this ruling in such a strict sense leads to increased paperwork and slower trade. Other legislation is not as strict regarding the manufacturer of the tyre; as long as the same specification of tyre is fitted, there is no problem.

(c) The main drivers for change in the specifications required of their tyres are the truck and car manufacturers. The manufacturers are continually looking for new ways to increase their performance which has led to a proliferation of types and sizes of tyre, e.g. through demand for increased load index of the tyres and higher speed capability. Another EU directive has been instrumental in the changes in requirements from the manufacturers – requirement of 4m maximum height of intercontinental trucks – which resulted in the demand for smaller tyres to help increase/maintain the loads available on intercontinental trucks.

(d) Other EU directives which have had an effect on the tyre manufacturers are the environmental emissions directives which have led to increased demand for more efficient tyres to increase kilometres per gallon.

Large European manufacturer No 1

(a) This company views itself as the market leader in tyre production in Europe.
(b) They produce a standard/uniform product at plants across the EU and the rest of the world and did so well before the implementation of the single market programme.
(c) For these reasons, they do not feel that the EU directives have had a great deal of effect on their business, viewing themselves more as the standard-setter with international coverage little affected by the Directive for type approval.
(d) There has been a slight increase in the degree of paperwork in some areas of their business, but they did not specify where and how.
(e) The company feels that their production has been affected by some EU directives regarding the environment and emissions from the production process; particularly by the strict application of emission standards in the UK.
(f) They feel that there has been little effect on the volume of their trade across Member States since it has a wide presence already established. However, they do feel that cross-border access has improved as a result of single market implementation.

UK tyre manufacturer

(a) This company harmonized its type approval for car and truck tyres across Europe in the mid-1980s. They had followed the regulations established by the UNECE setting a standard for marking and testing tyres which the EEC directive did not change.
(b) Given this, the effects of the EEC Directive were regarded as minimal. The only area which did change was the testing and marking for motorcycle tyres – a one-off cost to change the engraving for the moulds.
(c) With regard to administrative changes as a result of the EEC Directive, the volume car and truck tyre production has not been affected. Well before the Directive, all ECE countries which complied with the International Standards Organization standard for tyre testing and specifications required just one application for approval to sell their tyre 'literally anywhere'.
(d) The single restriction which this company regarded as a hindrance to trade and harmful to the consumer was the definition of category of tyre – Annex 2, 2.1 of the UNECE Tyre Regulation. The company feels this should refer to the type of tyre only and not the manufacturer or trade mark.

Large European manufacturer No 2

(a) This company has been developing its product on a Europe-wide basis for the past ten years.
(b) Type approval for their tyres has traditionally been obtained in Italy and then the specifications of tyre would be meted out to the different manufacturing centres.
(c) The implementation of the single market programme has not resulted in any changes in its production processes since it operated on a world-wide basis before and has not changed this since.
(d) This company is not aware of any further restrictions in this area that it feels the Commission should be aware of.

European Community opinion

(a) The European Community opinion is that the single market programme has had a negligible impact on the costs faced by tyre companies in the type approval application

process. This is largely because many companies already abided by the UN ECE regulations to act as European competitors.

(b) Given the international outlook of the tyre companies, the impact of the single market on the production processes were also felt to have been minimal. Increased globalization of competition has led to tyre companies trying to find as many ways as possible to cut costs in the production process. These moves to cost cutting have been affected by the single market to a small extent but are mainly because of moves to become global competitors.

(c) It is felt that there will be a reduction in the number of European competitors in the next downturn in the market. The Commission feels that there will be a need for rationalization as competition increases even more over the next few years.

(d) One future potential problem in the EU market for tyres is that as competition increases, the margins available to the tyre companies are likely to decrease. Many tyre companies are already looking at niche markets for their products – geographic or product markets – such as their home markets or the 'green' tyre. The Commission is concerned that these companies could come to dominate these niche markets and abuse their position to generate excess profits.

K.2. Automotive lighting systems and the single market

K.2.1. Introduction

The effects of the single market programme on the automotive sector were also examined with respect to the supply of automotive lighting systems. Lighting systems were one of the areas highlighted in the Ludvigsen (1988) study (along with windscreens and emissions), in which practical standardization had not yet been achieved. However, lighting systems legislation has been increasingly standardized (and updated for technological progress) across the EU since 1976. We interviewed a number of lighting systems manufacturers in Europe, to assess how important the programme has been to their business. The companies interviewed were:

(a) large French-owned lighting system manufacturer; (1)
(b) large German-owned lighting system manufacturer; (2)
(c) large UK lighting system manufacturer for commercial vehicles and coachbuilder; (3)
(d) large UK lighting system manufacturer. (4)

The questions each of these manufacturers were asked covered:

(a) the reduction in the variance of lighting systems within models over the past ten years;
(b) the cost reductions associated with such reductions in variance;
(c) the ways in which the single market programme influenced these reductions in variation (e.g. via type approval, legislation and/or the increasingly competitive single market environment created);
(d) the largest remaining causes of variance in lighting systems (to highlight areas where futher legislation may be necessary or desirable).

K.2.2. Summary

(a) The overall feeling seemed to be that the companies interviewed have not been directly affected by single market programme legislation, but rather indirectly, by an increasingly competitive market environment (in which the programme played a part). Companies

were unable to be specific about the ways in which the legislation reduced variation (apart from removing the need for yellow headlights in France).

(b) The increasingly competitive market environment seems to have engendered different responses from the customers of the lighting systems suppliers, depending on the sector in which those customers operate. For lighting systems supplied to car assemblers, the increased competition has led to a reduction in variants per car model, in order to reduce what is perceived as costly and unnecessary variation. Alternatively, for lighting systems supplied to commercial vehicles manufacturers and coachbuilders, the increased competition has led to an increase in variation, in order to differentiate vehicles. Previously the systems were more standardized, even between different producers.

(c) The differences in lighting systems caused by different hand drives (right hand/left hand) continues to be an irritant and an obstacle to reducing variation. Additionally, models offering options of wash/wipe systems for headlights are also seen as causing variation, as are models with the option of load levelling systems. However, these latter causes of variance should probably be seen as reflecting the competitive process, rather than requiring legislation.

Large European lighting system manufacturer (for car assemblers) (1)

(a) Generally, the company had noticed a reduction in variation within models over the previous ten years. The average number of variants was now down to four per model. They did have one customer with 32 variants in its lighting systems for one model, but this original equipment manufacturer (OEM) is now realizing that this is a costly practice.

(b) The company was unable to give a figure for the cost reduction associated with reduced variance.

(c) They thought the single market programme had influenced the reductions in variance that had occurred over the previous ten years, but only in the broad sense, as part of the general competitive process. The only specific example of what they saw as a single market programme generated reduction in variance was the removal of the need to supply yellow headlight bulbs to France.

(d) They saw the largest remaining causes of variance in lighting systems as car models which offered variants with/without wash/wipe systems for headlights, and variants with/without load levelling systems, which required different lighting systems.

Large European lighting system manufacturer (for car assemblers) (2)

(a) This company said it had seen no real reductions in variance over the previous ten years, arguing that the main cause of variation over these years, had been and still remained the left hand/right hand drive imposed constraint.

(b) Not applicable.

(c) Not applicable.

(d) The main cause of variation, as indicated in (a) were left hand/right hand drive imposed differences.

Large UK lighting system manufacturer (for commercial vehicles and coachbuilders) (3)

(a) The new model cycle of this firm's customer base is greater than that of the car industry. Nevertheless, they had acually noted an increase in the number of lighting systems they were being asked to produce. This was due to styling becoming increasingly important as customers sought an individual style. This was linked to the increasing importance of controlling the aftermarket as competition squeezed margins on original equipment.

Indeed the firm was finding it increasingly difficult to offer a standard lamp across its customer base.

(b) The increase in variation was not seen as greatly affecting the costs to the firm, because of the already low volume of production (relative to the car industry).

(c) The single market programme was seen as having influenced the increase in variation, to the extent that it had opened up borders, reduced barriers and increased competition, making styling more important and thus affecting variation.

(d) The greatest remaining causes of variance (apart from styling) for this firm, were new technological developments, such as LEDs and gas discharge illumination.

Large UK lighting system manufacturer (4)

This manufacturer's system for type approval works as follows (and has not been affected by the single market programme):

(a) The standards are specified by the customer.

(b) The legal requirements for lighting concern the performance of the lighting and the power of the signal.

(c) Usually the type approval system specified is UNECE (Regulation 20). Sometimes customers specify the EC or the US regulation (FM VSS 108). Other than these legal requirements, the customer makes the specifications. One big difference between lighting and tyres/exhausts is the much lower aftermarket demand, which means lighting is much more customer led.

(d) The single market programme has not made any appreciable difference in procedures. They also use the British Standards Institute and VDA.

K.3. Exhausts and the single market

The market for exhaust systems in Europe is a complex one. These items are bulky and difficult to store, making international trade in such products unattractive. The basic technology of exhaust manufacturing, involving roll forming, presswork and welding offers no great difficulties or even particularly large investments.

Historically then, the European industry developed along fragmented and nationalistic lines. Moreover, sourcing of exhausts varies widely: some vehicle assemblers will buy in a complete system from one supplier, others will assemble exhausts themselves from supplied components.

The degree of vertical integration in exhaust manufacture varies widely too, particularly at individual plant level – a feature which complicated the Cardiff-Cambridge Benchmarking study (Cardiff Business School) for example.

However, as a product, exhausts have changed quite considerably over the years. The most important changes have been:

(a) greater proliferation of types per model range;

(b) meeting regulatory requirements.

With respect to the former point, proliferation of exhaust types has been driven by the increasing variety within any one model family offered by a vehicle assembler (in engine types and drivetrain systems) which influences exhaust design. It should also be noted that increasing variety gives a benefit to vehicle assemblers and their distribution systems in terms

of competing with the independent aftermarket. It is indicative that front wheel drive Ford Escorts have over 50 varieties of exhaust system.

In terms of regulatory performance, exhaust systems have been made more complex and costly as a result of meeting emissions and noise level requirements; most obvious here is the addition of catalysts. Additionally, the product has greater longevity, with an average replacement time of 2–3 years rather than the 18 months that used to pertain – a key element here is the greater use of coated steels. Greater longevity has a profound effect on the aftermarket, both in terms of manufacturers supplying product and for the service centres which undertake exhaust replacement work. In the period 1984–94 it is thought that the replacement volume in the UK fell from 18 million transactions (i.e. exhausts or parts of exhausts) to 10 million.

The most important influence on variant costs in exhaust production arises from vehicle assembler strategy on platforms, model variants, and engine/transmission choices. In brief, this has driven a rise in variant numbers rather than the economies of standardization which might be expected from single market measures to harmonize standards, etc. The most important market distortion arises out of the right hand/left hand drive issue. In essence exhaust systems have to fit a package space which is determined mainly by the platform on which the car is built – so moves to reduce the number of basic car platforms in Europe could increase manufacturing scale at the exhaust suppliers.

The most recent estimates on market share and size come from the Economic Intelligence Unit (EIU). They must be regarded strictly as estimates, because there are few agreements over definitions, etc.

Table K.1. Western Europe exhaust sales (million units), 1988–92

Year	Original equipment	Replacement	Total
1988	12.2	51.6	63.8
1989	13.7	53.0	66.7
1990	13.6	55.5	69.1
1991	13.2	58.4	71.6
1992	13.7	60.0	73.7
1993	11.8	61.6	73.4
1994	12.3	63.1	75.4

Source: EIU.

It is thought that two companies hold a significant share of the market: Tenneco Walker (about 20%), and Bosal (about 15%). As the above table shows, the aftermarket is vital to companies in the automotive exhaust business. Growth in sales can be expected in those markets which are introducing more rigorous vehicle testing regimes (France, Greece, Spain), but these gains may be offset by reductions in the stock of older vehicles following the introduction of scrapping incentives.

The size of the market in value terms is equally difficult to estimate, but is thought to be in the region of ECU 2.5 billion for the five leading EU markets.

The leading players are:

Tenneco Walker. US-owned (Tenneco Automotive), world's largest exhaust manufacturer. Offers over 2,000 references for car models in Europe alone. Manufacturing facilities in France (3 sites), Germany (3 sites including subsidiary) and UK (2 sites). Also plants in Sweden, Denmark, Norway, Finland and Portugal. European HQ in the Netherlands. R&D in Germany.

Bosal. Dutch company with range of interests in steel tubes, tow-bars, etc. Major R&D base and HQ in Belgium. Also manufacturing plants in France, UK (2), Spain, the Netherlands, and Denmark.

Arvin. US-owned. This company has, in recent years, sought to expand its presence on the European aftermarket, mainly by acquisition of existing companies and joint ventures in France, Germany and Italy, largely building from the strong UK base established over many years.

ECIA. The dominant OE supplier in France is owned by PSA, which supplies virtually all exhausts for this company. It even supplies Renault, and is thought to have about 25% of the aftermarket in France and manufactures about 9 million systems per annum.

Cromodura. This is a subsidiary of Gilardini, which in turn is owned by Magneti Marelli, and in turn owned by Fiat. It is the largest OE and aftermarket supplier in Italy with two very large plants.

Other exhaust suppliers in Europe include:

Eberspacher (Germany), leading challenger to Bosal and Tenneco;
Descam (Italy), subsidiary of ITT Industrie Riunti, aftermarket only;
Zara (Italy), aftermarket only;
Ansa Marmitte (Italy), high performance exhaust systems;
Fonos (Spain), major OE supplier, 35% of aftermarket in Spain;
Armstrong-Bosal (Spain), joint venture in Spain;
Inducar (Spain), small independent producer of partial systems in Spain;
Situbsa (Spain), 50% owned by Gilardini;
Gillet (Germany);
Roth Technic (Germany);
Leistriz (Germany);
Sebring (Germany), performance exhausts.

APPENDIX L

Regression analysis

L.1. The model

The equation analysed took the following form:

$$\text{Automotive employment}_i = \alpha_0 + \beta_1 \text{Unit Sales}_i + \beta_2 \text{Average cost of labour}_i + \beta_3 \text{GDP}_i + \text{DUMMY1} + \text{TREND} + \varepsilon_i$$

Where:
i = the number of observations;
α_0 = the constant;
ε_i = the residual 'noise';
DUMMY1 = takes the value zero for observations before 1993 and one afterwards;
TREND = intends to take out any trend factors unrelated to the other variables; and
β = the coefficients.

L.2. The variables chosen

We chose the variable 'unit sales' because it will reflect the demand for new automotive product – unit sales and automotive employment should be positively correlated with each other. We chose the variable 'cost of labour' because employment will be affected by this – as cost of labour increases, employment is likely to fall. We chose GDP since this will reflect the general health of the economy. The strength of the economy should be a determinant of employment in the automotive industry – as GDP increases, so too should automotive employment.

We have not considered productivity since this relates directly to the number of persons employed and would create serious problems for the regression analysis. Imports were also not included because they will be related directly to unit sales, creating problems of multicolinearity.[11]

L.3. The data and regression results

All the data are for the whole of the EU in aggregate, but only ten observations were available from the different sources of data available (1985–94). The lack of consistent data from these sources, limiting our analysis to only ten observations, are a severe constraint on the validity of the analysis. The results presented below, therefore, are not intended as any 'proof' of a relationship one way or another.

[11] Multicolinearity arises where variables on the right hand side of the equation to be modelled are correlated with each other. This creates serious problems for the robustness of the model.

Table L.1. Employment regression results using linear functional form

Variable	Coefficient	t-statistic[2]
Constant	1107.37	17.58
Lagged unit sales	6.54	1.10
Labour costs	0.03	1.27
GDP	-3.76	-2.96
Dummy	-48.22	-3.17
R^2 [3]	0.95	
F-statistic[4]	25.99	

Source: Ernst & Young.

[2] The t-statistic indicates the level of significance of the variable to the equation. If the t-statistic is greater than 1.96, we can state wth 95% confidence that the variable is statistically significant.

[3] R^2 indicates how much the variables are explaining employment. In this case, they are explaining 95% of the variation in employment.

[4] The F-statistic indicates whether all of the variables in the equation together are significant – they are statistically significant explanators of employment. If the F-statistic is greater than the critical value – based on number of variables and observations – then the explanatory variables are jointly significant.

Despite the fact that the F-statistic indicates that the variables are significant explanators of employment, the results from this analysis are poor. Unit sales were found to have had no impact on employment at all; 'lagging' this variable to see whether sales last year are more of a determinant of employment this year did not improve the result. Labour costs were also found to be statistically insignificant. Despite the fact that, as expected, the single market programme appears to have had a negative impact on employment, GDP is also negatively correlated with employment, against expectations. Despite the fact that the equation appears to be telling us that the single market programme has had the expected result, it would be wrong to draw any firm conclusions from any result based on data from only two observations for 1993 and 1994.

The strange result of a negative relationship between GDP and employment might have been caused by multicolinearity (high correlation between explanatory variables) or omitted variables creating serial correlation[12] (often a problem with time series analysis). We checked for multicolinearity but found no significantly high correlation between the variables. More data on a consistent basis are not available to avoid an omitted variable problem.

To get over the possible problem of serial correlation, the equation can be modelled using differences. The results are presented in Table L.2.

[12] Serial correlation is a common problem with time series regression. It occurs where the error terms are correlated when they should be independent. The explanatory variables do not sufficiently explain the variable we are regressing, resulting in inconsistent results. The explanatory variables are no longer the best estimators resulting in an over-optimistic R^2.

Table L.2. Employment regression results using data in differences

Variable	Coefficient	t-statistic
Constant	-0.20	-1.77
GDP	0.49	1.36
Dummy	-0.03	-2.39
R^2	0.72	
F-statistic	7.67	

Source: Ernst & Young.

The F-statistic is significant and the coefficient on GDP is the expected sign but is not statistically significant. By calculating differences, we lose another observation, so a lack of significance is not entirely surprising given that we have only nine observations to model. The dummy for the single market programme implementation is once more negatively correlated with employment – employment has fallen in 1993 and 1994. As these results are not entirely satisfactory, we have also modelled the data in logarithmic form. The results of this are presented in Table L.3.

Table L.3. Employment regression results using data in logs

Variable	Coefficient	t-statistic
Constant	7.55	24.47
GDP	-0.15	-2.19
Dummy	-0.08	-6.02
R^2	0.91	
F-statistic	38.67	

Source: Ernst & Young.

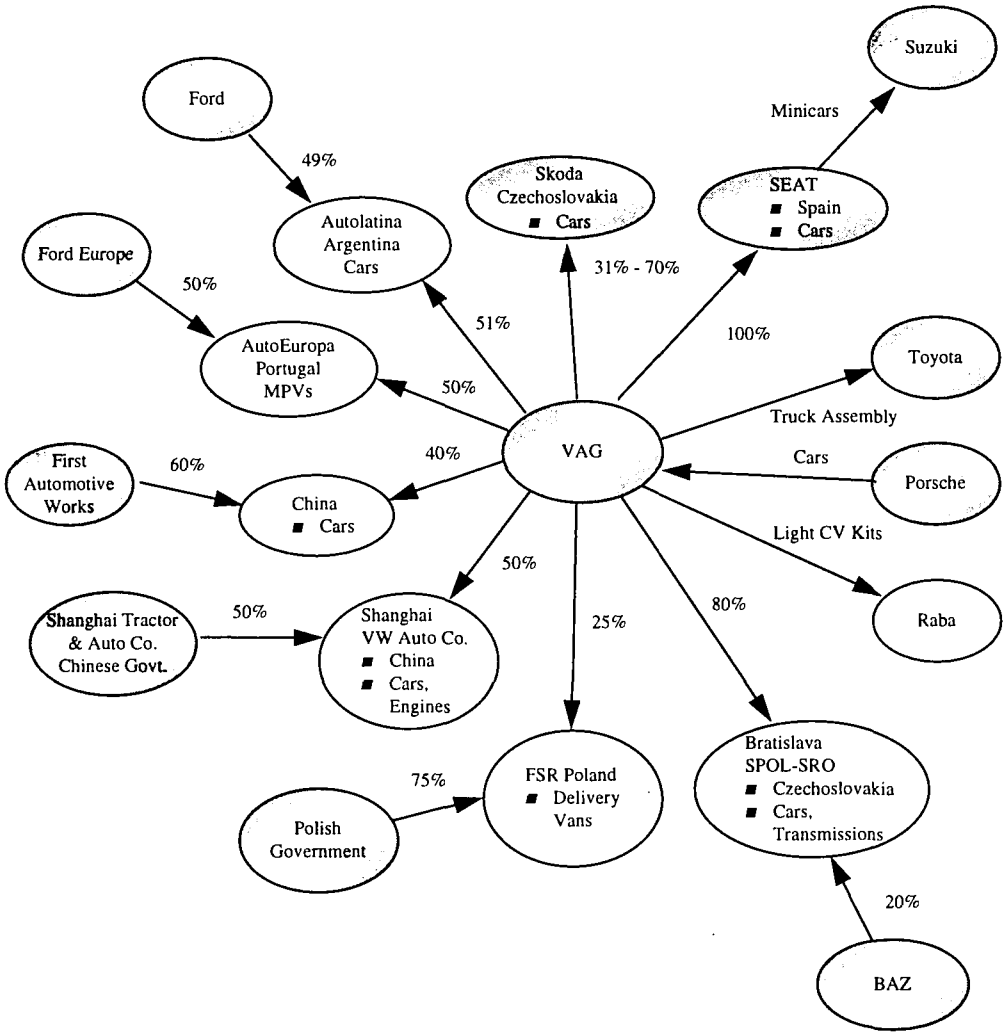
The F-statistic indicates that the variables are significant explanators of employment, but unit sales and cost of labour were both insignificant so we did not use them in this model. Again, although employment appears to have fallen as a result of the single market programme, the result for GDP is confusing.

In summary, from our regression results, we believe that any strong conclusions regarding this analysis and the impact of the single market programme on automotive employment would be extremely dangerous. Extreme limitations in data, strange observed relationships between variables and a lack of observations all cast doubt on the validity of the results. For example, it seems clear that our data for EU GDP are weak, failing to pick up the fall in employment as a result of the recent recession. This weakness will affect the observed relationship between the single market programme and automotive employment.

APPENDIX M

Strategic alliances

Figure M.1. Volkswagen - Audi Group: relationships with other companies world-wide

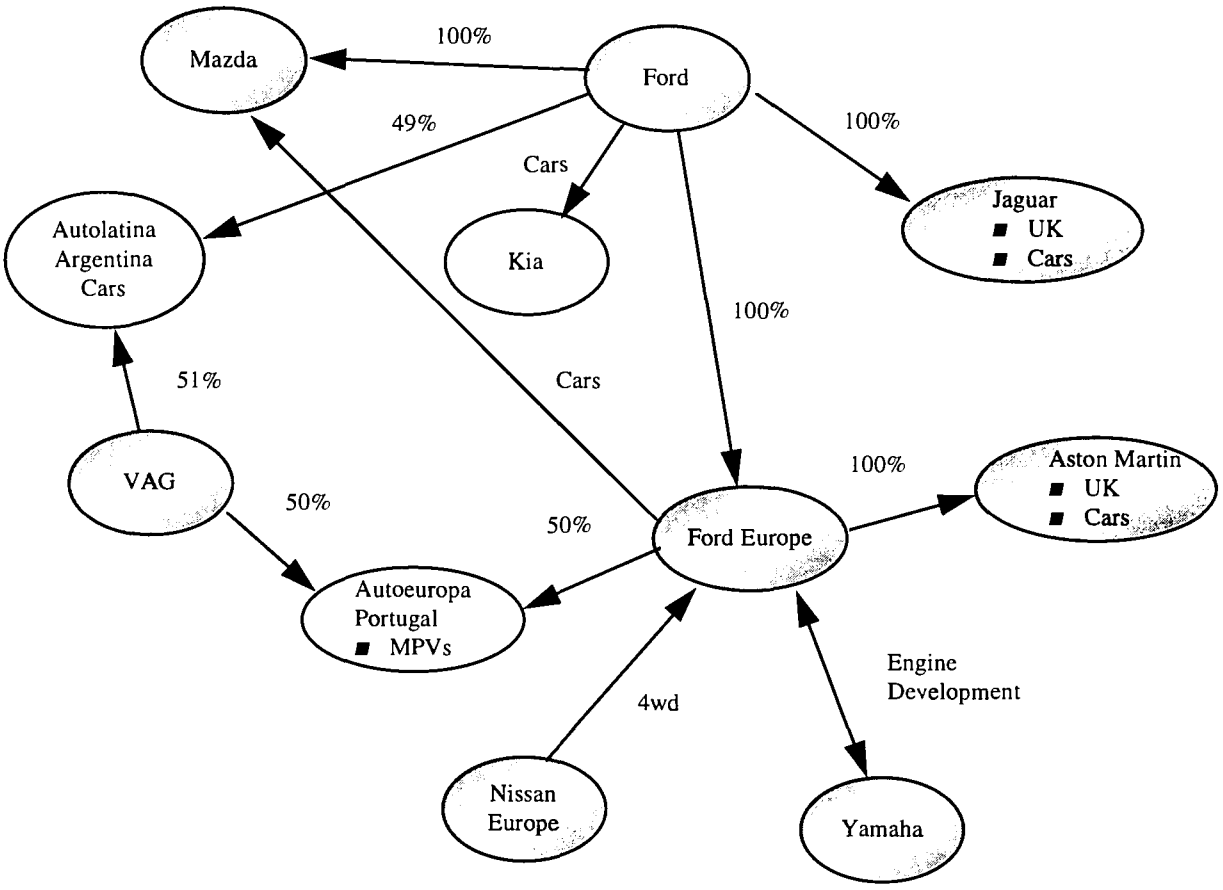


VAG:

(a) is taking over Skoda;
(b) has taken over SEAT, which will make minicars for Suzuki;
(c) has a joint venture (JV) with Ford in Argentina, called Autolatina (now ending);
(d) has a JV with Ford Europe in Portugal, called Autoeuropa, producing MPVs;
(e) has a JV with First Automotive Works in China to produce cars;
(f) has a JV with Shanghai Tractor & Auto Co. and the Chinese Government, called Shanghai - VW, to produce cars and engines;
(g) has a JV with the Polish Government in Poland, called FSR, to produce delivery vans;
(h) has a JV with BAZ in the Czech Republic, called SPOL-SRO, to produce cars and transmissions;
(i) is supplying Raba with light CV kits;

(j) is supplied with assembled cars by Porsche in Germany;
(k) is assembling trucks for Toyota in Germany.

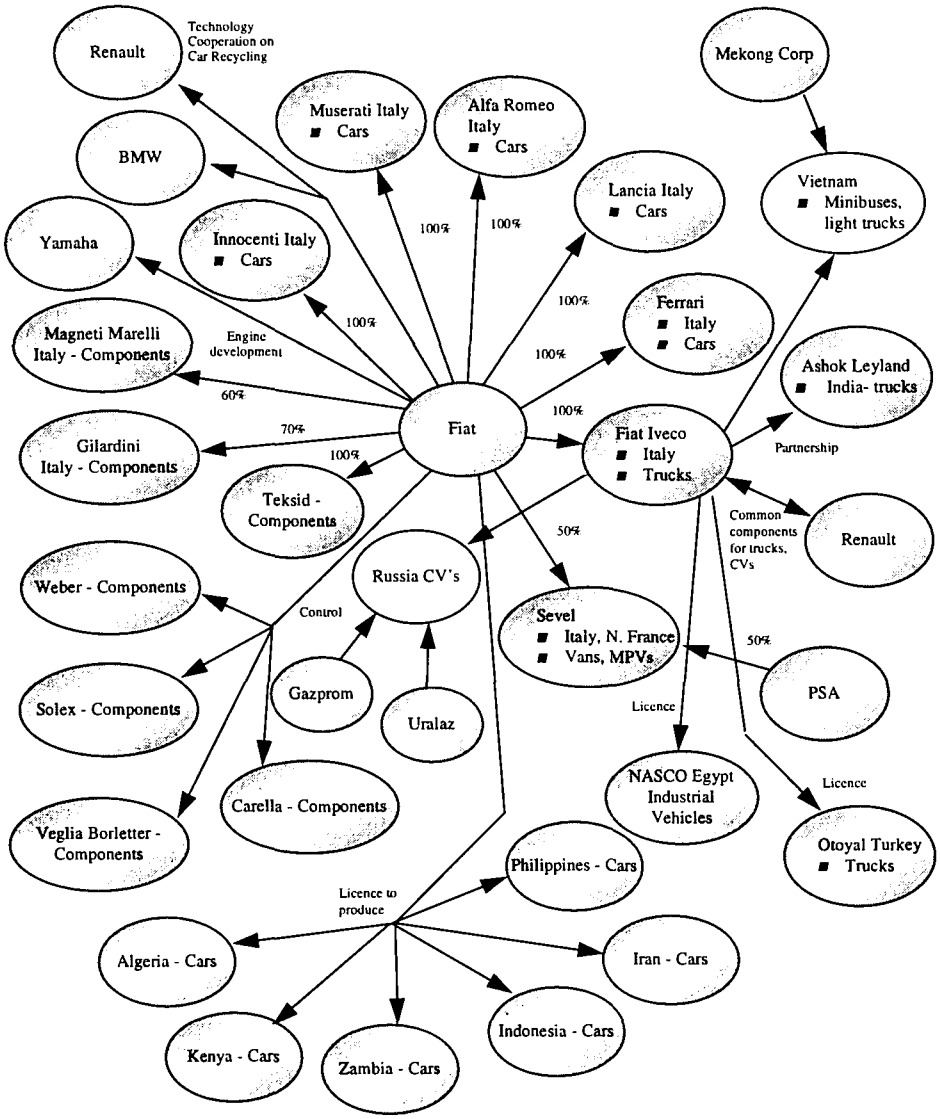
Figure M.2. Ford Group: relationships with other companies world-wide



Ford:

(a) owns Jaguar Cars;
(b) owns 25% of Mazda;
(c) owns Ford Europe;
(d) has a JV with VAG, in Argentina, called Autolatina (now ending) producing cars;
(e) through Ford Europe, owns Aston Martin;
(f) through Ford Europe, has a JV with VAG in Portugal, called Autoeuropa, producing MPVs;
(g) through Ford Europe, is supplied with 4 wheel drives by Nissan Europe (Spain);
(h) through Ford Europe, will produce cars for Mazda in the UK;
(i) through Ford Europe, has developed engines with Yamaha (sigma engine).

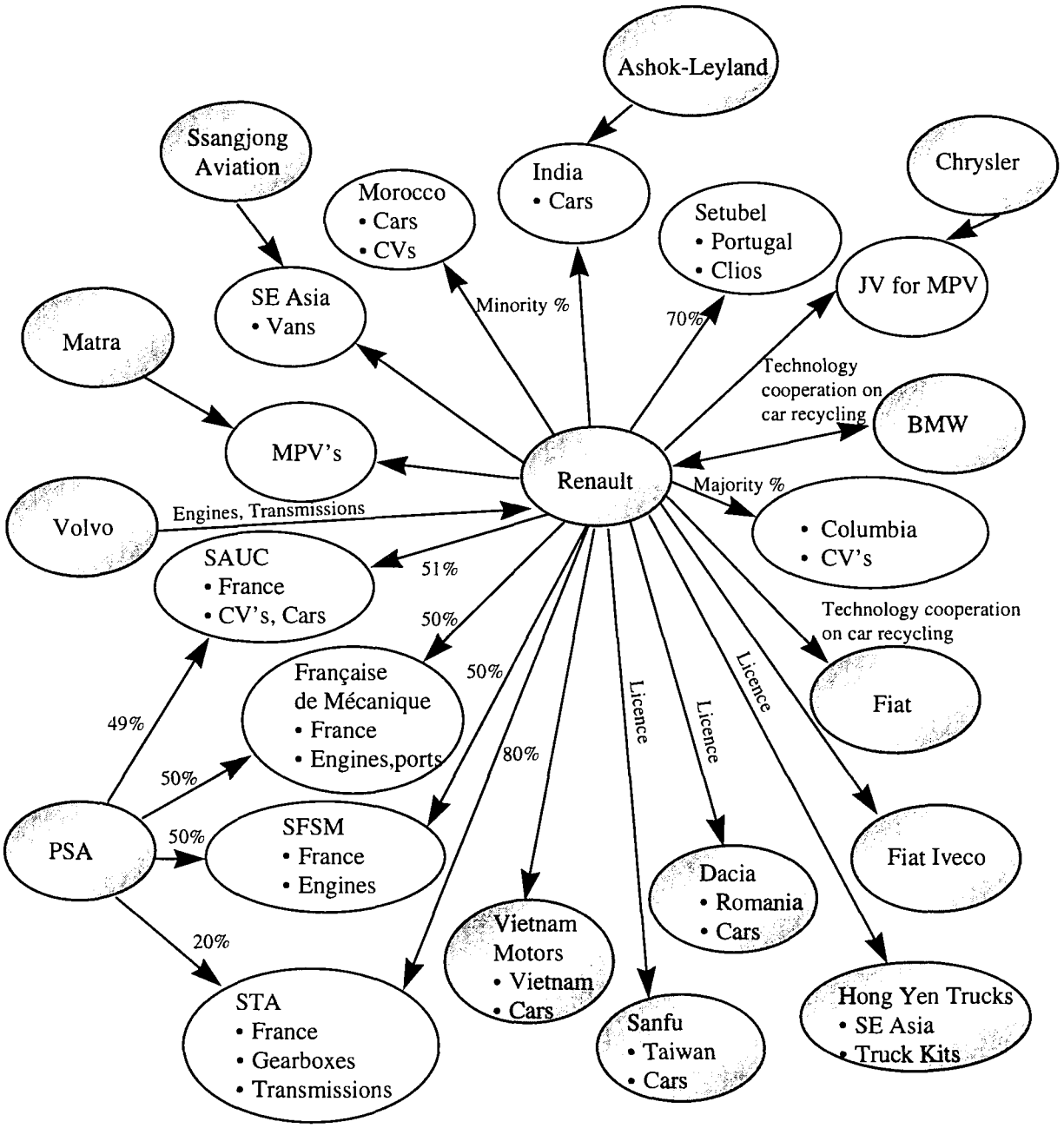
Figure M.3. Fiat Group: relationships with other companies world-wide



Fiat Group:

(a) owns Maserati, Alfa Romeo, Lancia, Ferrari, Fiat Iveco;
(b) controls component firms Magneti Morelli, Giardini, Teksid, Weber, Solex, Veglia Borleti, Carello;
(c) has agreements with Renault and BMW on car recycling cooperation;
(d) has licensing agreements with car assemblers in Iran, the Philippines, Indonesia, Zambia, Kenya, Algeria;
(e) has a JV with PSA in Italy and northern France, called Sevel, to produce vans and MPVs;
(f) through Fiat Iveco, has a JV with Mekong Corp. in Vietnam, to produce minibuses and light trucks;
(g) through Fiat Iveco, has a partnership with Ashok Leyland in India, to produce trucks;
(h) through Fiat Iveco, has an agreement with Renault to produce common components for trucks and CVs;
(i) through Fiat Iveco, has licences with Nasco (Egypt) and Otoyel (Turkey) for industrial vehicles and trucks.

Figure M.4. Renault: relationships with other companies world-wide

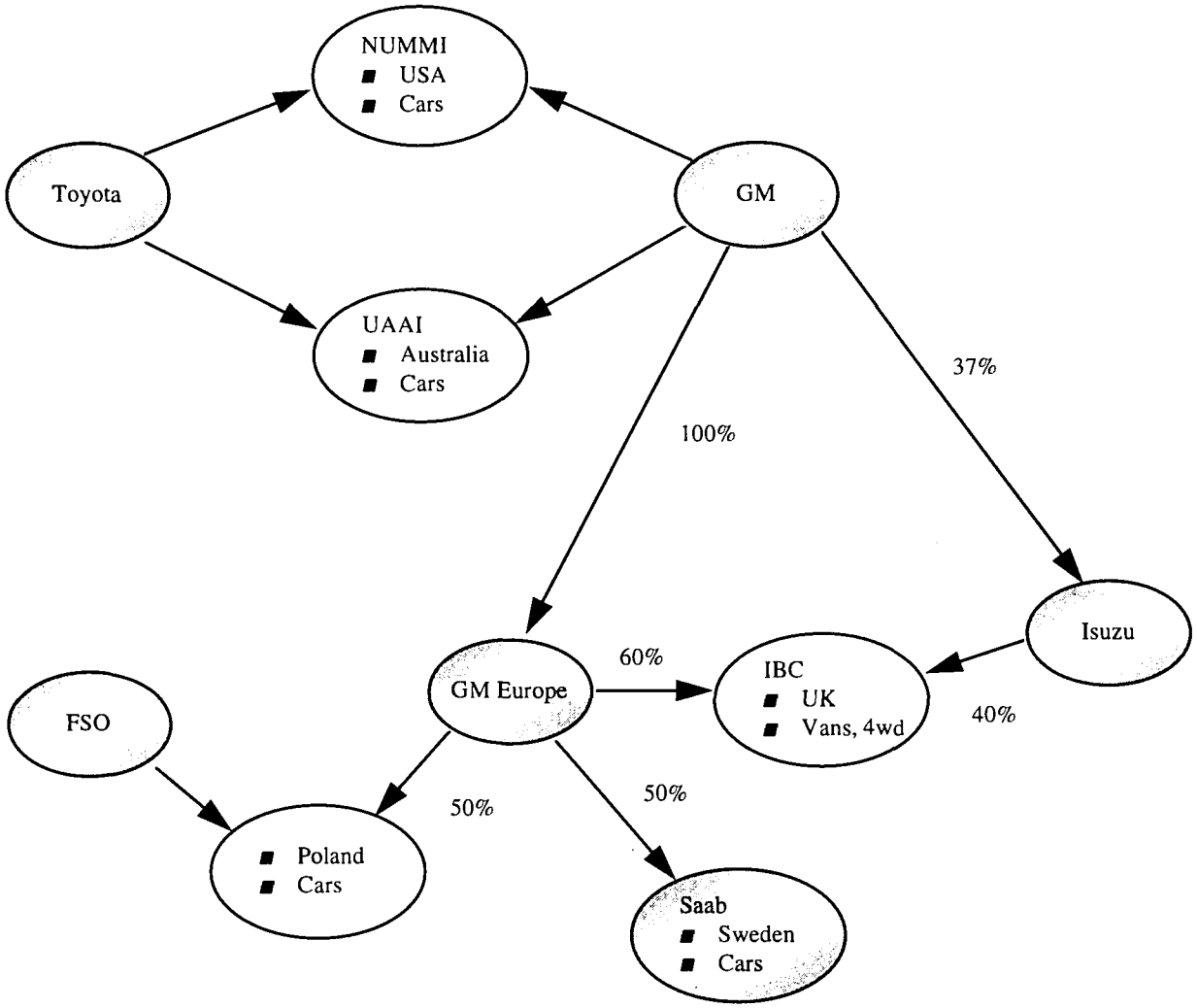


Renault:

(a) owns 70% of Setubel in Portugal, which produces Clios;
(b) has a JV in India, with Ashok Leyland, to produce cars;
(c) has a minority ownership of a plant in Morocco producing cars and CVs;
(d) has a JV in South-East Asia, with Sanjong Aviation, to produce vans;
(e) has a JV with Matra, to produce MPVs (Espace);
(f) has a majority ownership of a plant in Columbia, producing CVs;
(g) has JVs with Peugeot, France, to produce CVs, cars, engines, gearboxes, transmissions;
(h) has a technology agreement with Fiat, on car recycling;
(i) has engines and transmission made for it by Volvo;

(j) has licences with Dancia (Romania), Hong Yen (South-East Asia), Sanfo (Taiwan) and Vietnam Motors.

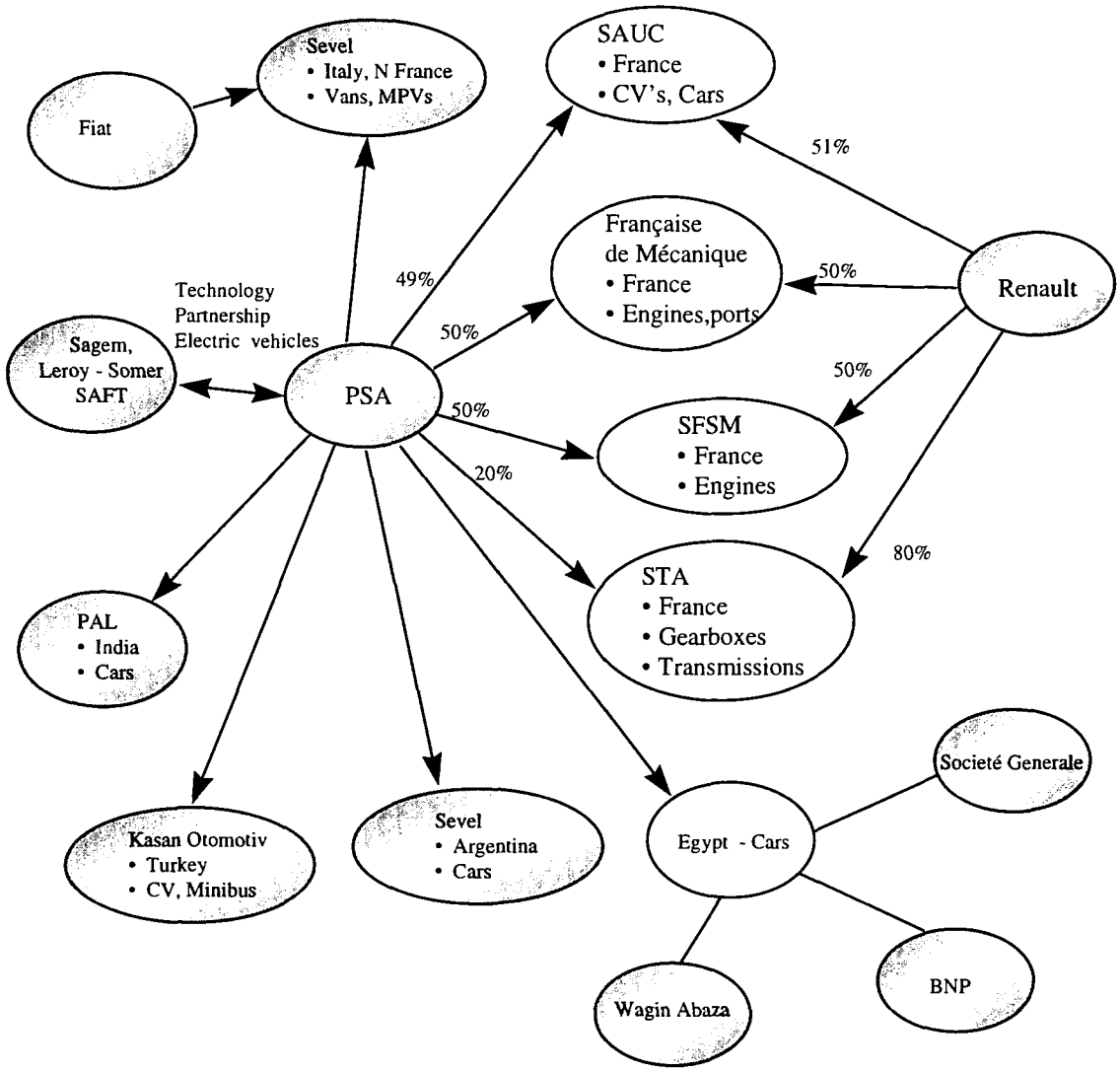
Figure M.5. GM Group: relationships with other companies world-wide



GM:

(a) has JVs with Toyota, to produce cars in the USA and Australia;
(b) owns 37% of Isuzu;
(c) owns GM Europe;
(d) through GM Europe, owns 50% of Saab;
(e) through GM Europe, has a JV with Isuzu, in the UK, called IBC, to produce vans and 4 wheel drives;
(f) through GM Europe, has a JV with FSO in Poland, to produce cars.

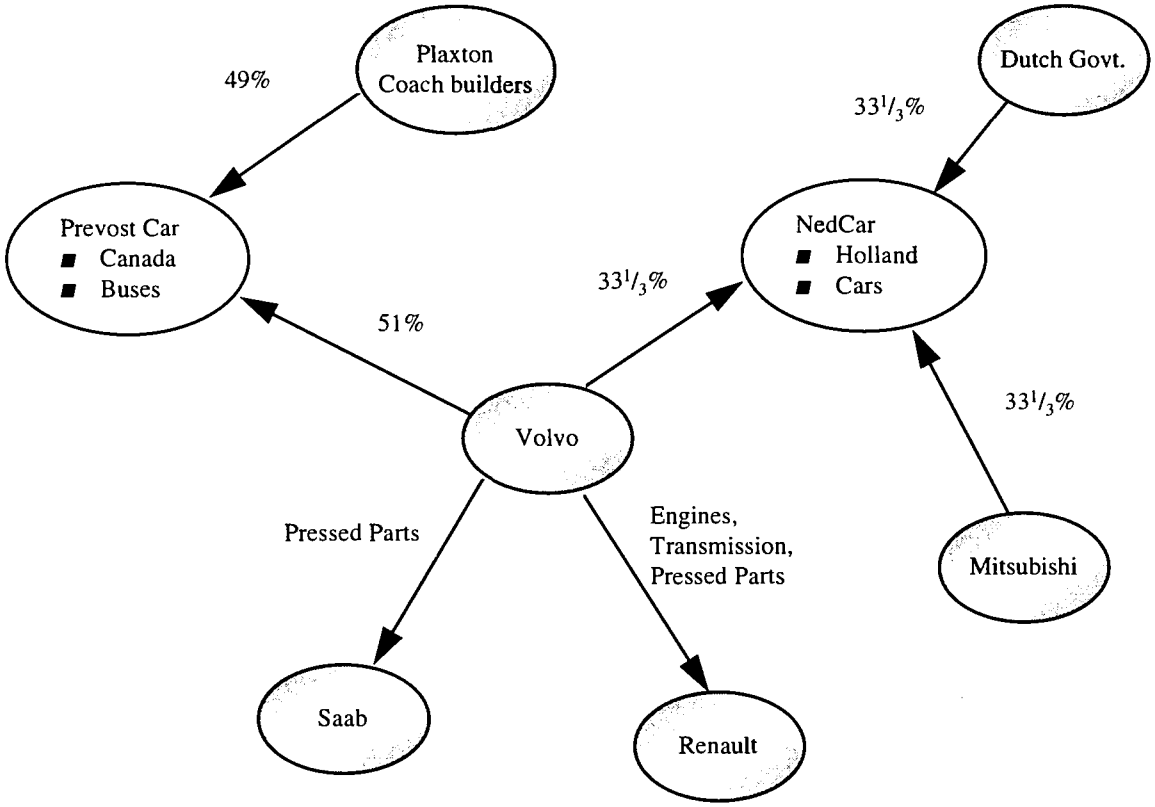
Figure M.6. Peugeot-Citroën (PSA Group): relationships with other companies world-wide



PSA:

(a) has JVs with Renault, in France, for cars, CVs, engines, gearboxes and transmissions;
(b) has a JV with Fiat in Italy and northern France, called Sevel, to produce vans and MPVs;
(c) has a JV in Egypt, to produce cars;
(d) has a technology partnership with Sagem, for electric vehicles;
(e) has licences with PAL (India), Kasan (Turkey) and Sevel (Argentina) for cars and CVs.

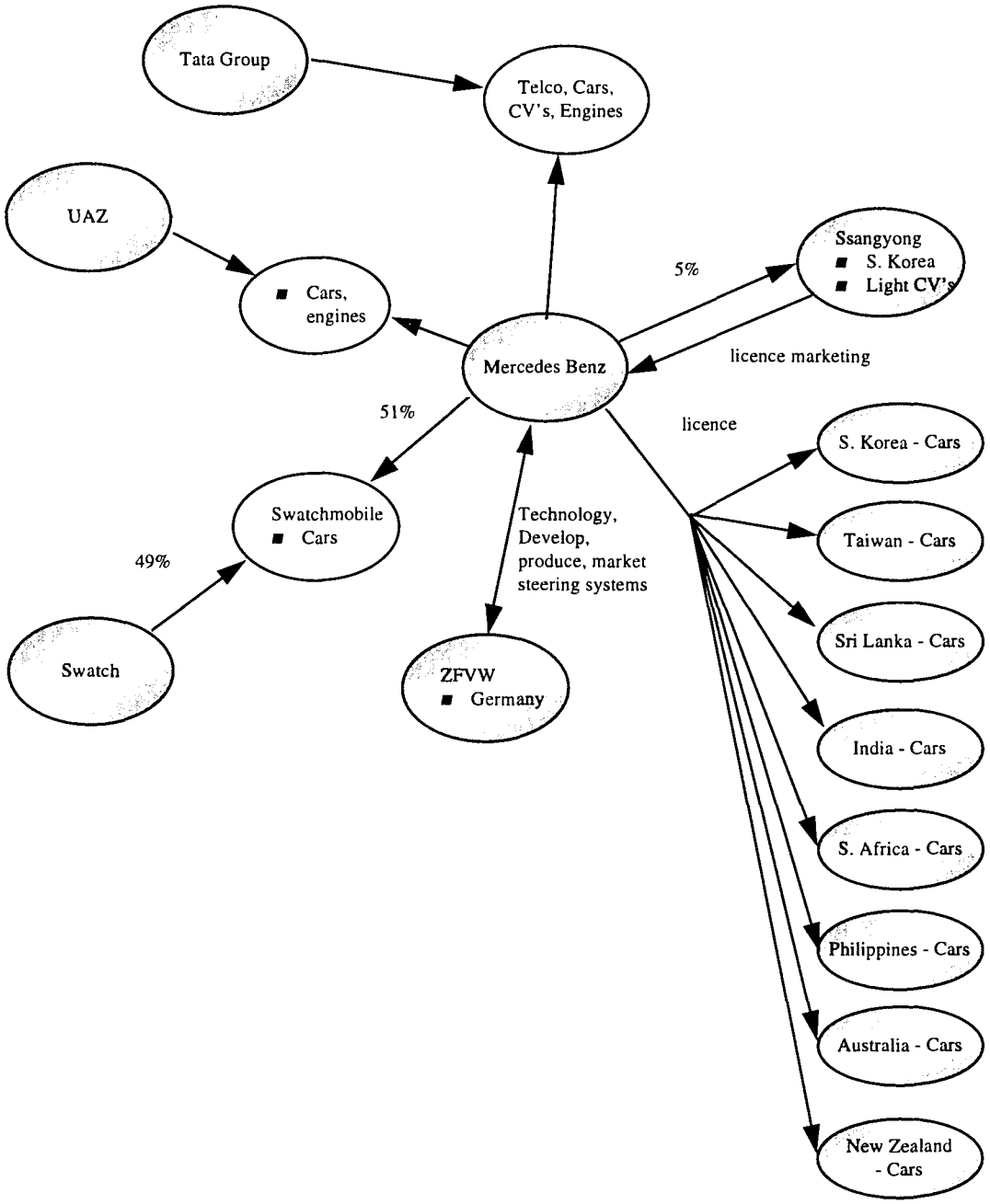
Figure M.7. Volvo Group: relationships with other companies world-wide



Volvo:

(a) has a JV with Mitsubishi and the Dutch Government in the Netherlands, called NedCar, to make cars;
(b) has a JV with Plaxton Coachbuilders, in Canada, called Prevost car, to produce buses;
(c) produce pressed parts for Saab;
(d) produce engines, transmissions and pressed parts for Renault.

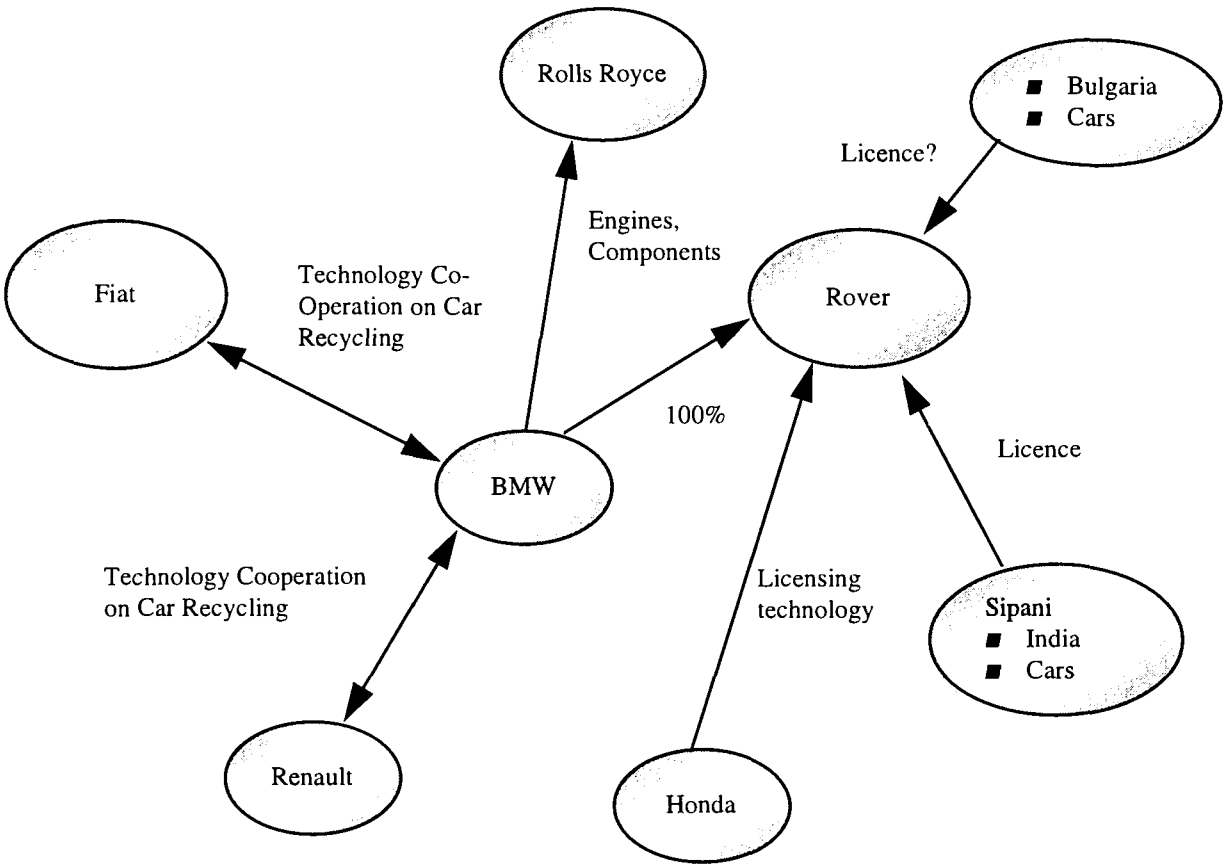
Figure M.8. Mercedes-Benz: relationships with other companies world-wide



Mercedes-Benz:

(a) has a JV with the Tata Group, called Telco, to produce cars, CVs and engines;
(b) has a JV with UAZ, to produce cars and engines;
(c) has a JV with Swatch, to produce the Swatchmobile;
(d) has a 5% share of Ssangyong in South Korea, a licensing agreement for technology to produce light CVs and a marketing agreement to market Ssangyong light CVs in Europe;
(e) has a technology agreement with ZFVW in Germany, to develop, produce and market steering systems;
(f) has agreed licences with partners in South Korea, Taiwan, Sri Lanka, India, South Africa, the Philippines, Pakistan and New Zealand.

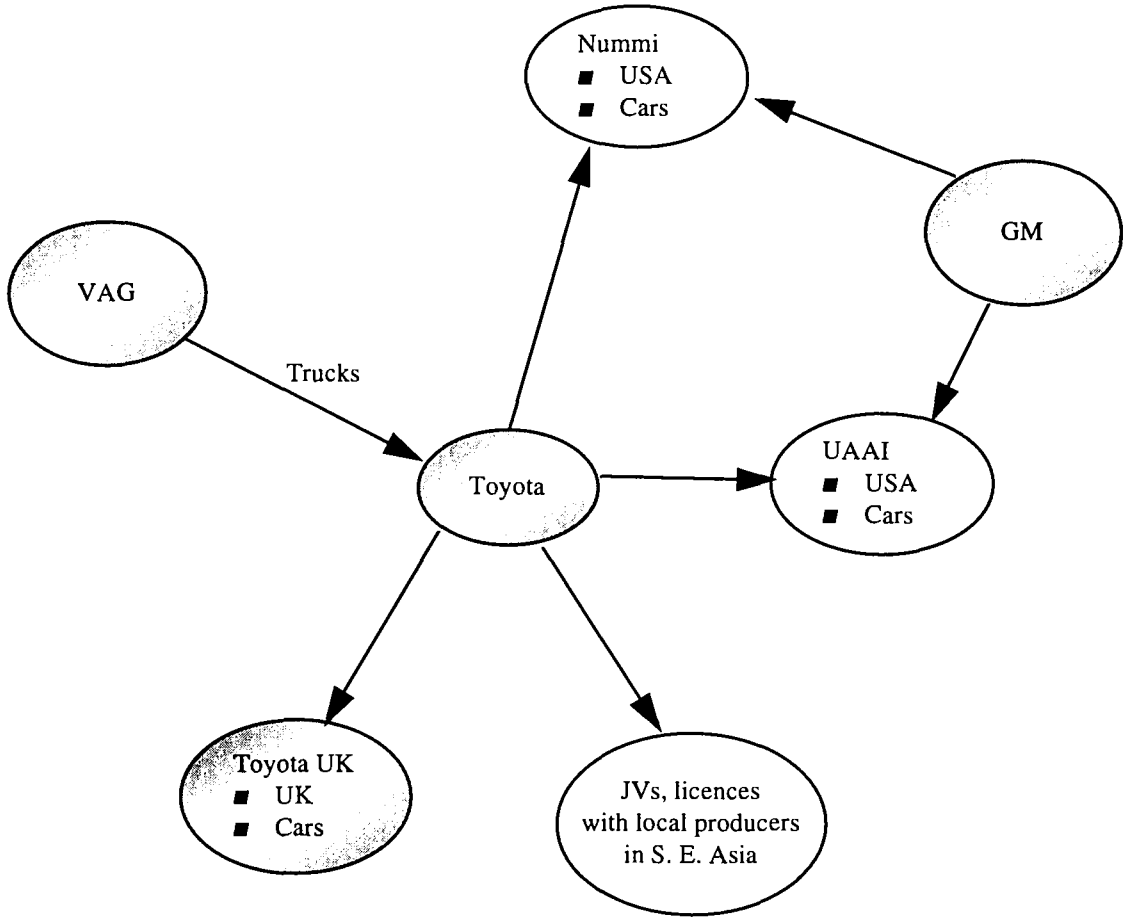
Figure M.9. BMW Group: relationships with other companies world-wide



BMW:

(a) owns Rover;
(b) supplies Rolls Royce with engines and various components;
(c) has technological cooperation agreements with Fiat and Renault on car recycling;
(d) through Rover, has licences with Bulgarian and Indian producers for cars;
(e) through Rover, is licensing technology (on cars).

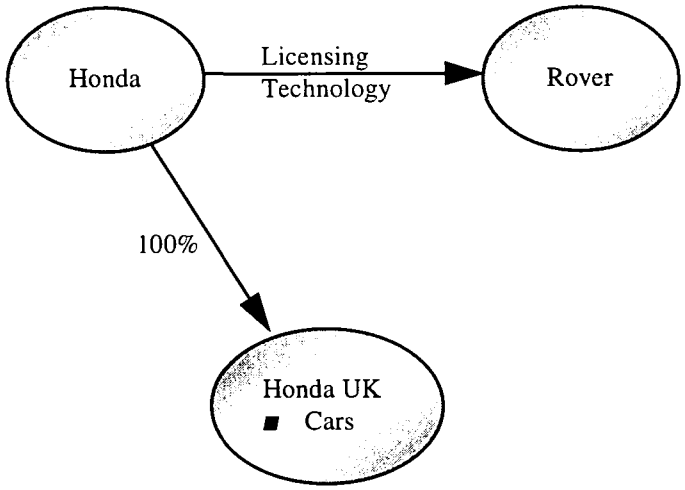
Figure M.10. Toyota Group: relationships with other companies world-wide



Toyota:

(a) owns Toyota, UK;
(b) has JVs in Australia and USA, with GM, to produce cars;
(c) has trucks produced for it, by VAG, in Hoover Germany;
(d) has various JVs in licences with producers in South-East Asia.

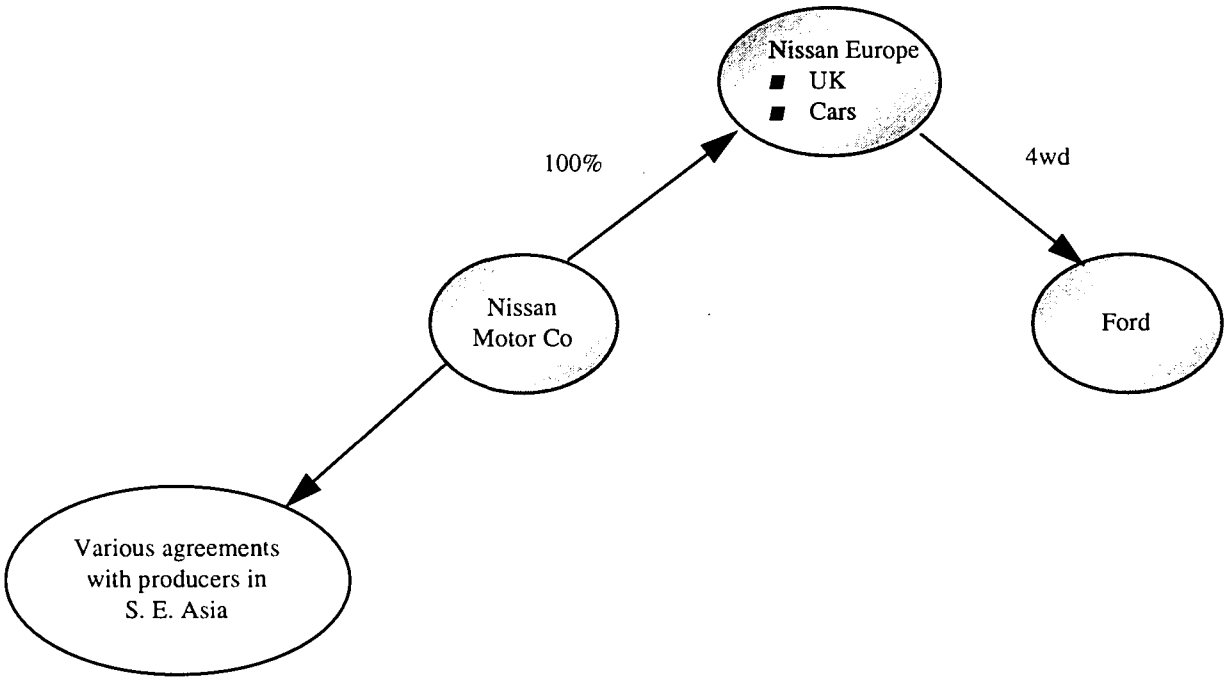
Figure M.11. Honda Group: relationships with other companies world-wide



Honda:

(a) licenses its technology to Rover;
(b) owns Honda UK.

Figure M.12. Nissan Group: relationships with other companies world-wide



Nissan:

(a) owns Nissan Europe;
(b) through Nissan Europe (Iberia, Spain) produces 4 wheel drives for Ford;
(c) has various agreements with producers in South-East Asia.

APPENDIX N

Sources of information

Networks
IMVP (MIT programme)
Permanent Group for the Study of the Automotive Industry and its Employees (GERPISA), French-based international network
Academic experts
Jean-Jacques Chanaron (Coopers & Lybrand's automotive expert, CNRS)
E. de Banville (CNRS)
Guiseppe Volpato (University of Venice)
Aldo Enrietti (University of Torino)
Ben Dankbaar (University of Maastricht)
Ulrich Jurgens (WZB, Berlin)
Y. Lung (University of Bordeaux)
G. Carillo (University of Madrid)
P. Cooke (Henley Management College)
Frank Den Hond (Vrije Universiteit)
Main published sources
Economist Intelligence Unit reports
Eurostat
European Commission's Automotive Pricing Quarterlies
ACEA publications
CEPA publications
Boston Consulting Group's Report on Automotive Components
Financial Times Reports
Industry bodies: Association of European Automotive Manufacturers (ACEA), Associazione Nazionale Fra Industrie Automobilistiche (ANFIA), Comité des Constructeurs Français d'Automobiles (CCFA), Association of European Component Manufacturers (CLEPA), Fédération des Industries des Equipments pour Véhicules (FIEV), Society of Motor Manufacturers and Traders (SMMT), Verband der Automobilindustrie eV (VDA).

Note: The contractors are aware of some of the difficulties involved in interpreting data sources, such as currency fluctuations, different definitions of production volumes, different approaches to counting foreign assembly plants.

APPENDIX O

Views from companies on market share changes

O.1. Mercedes-Benz

The introduction of the new E-class (with sales of 2.7 million cars, this was the most successful Mercedes of all time) in 1984 had as an effect the rise of its domestic market share (which peaked in 1985). The downward trend from 1985 to 1992 is due to the weak economy. The rise of the market share from 1992 can be explained by the introduction of the new E-class model. Between 1990 and 1993, Mercedes benefited from the new East German demand which overcompensated for the falling sales in other countries. That is the reason why the domestic sales of Mercedes as a proportion of total global sales peaked in 1991.

O.2. Peugeot and Citroën

The influences affecting the domestic market share and the proportion of global sales sold nationally of both Peugeot and Citroën are caused by new model launches and the changes in the national/international levels of competition.

Since 1990, the company has developed their sales due to the SMP. The PSA Group produce more of all their makes in foreign countries (particularly in Europe) and have achieved higher sales in Europe. This trend was stimulated by the fall of trade restrictions and the common European legislation introduced by the SMP. Pricing policies have not been changed significantly during the period.

It should be noted that since 1995, the devaluation of the Italian and Spanish currency had a significant effect on sales in these countries.

O.2.1. Peugeot

Domestic market share

The relatively high domestic market share of Peugeot in 1985 and 1988 was mainly caused by the introduction of new models. The 205 was introduced in 1983 and achieved a peak in sales two years later. The introduction of the 405 in 1987 was an immediate success within one year which caused the rise of Peugeot's domestic market share. As far as the period from 1990 to 1993 is concerned, the high number of model launches from national and international competitors constantly weakened Peugeot's domestic market position.

Domestic sales as a proportion of total global sales

The reason why the national sales were relatively high compared to global sales of the PSA Group in 1985 was that it acquired the French automobile company Talbot in the same year. Talbot, whilst obtaining good sales in France, was quite unknown in other countries.

The downwards trend in Peugeot's domestic sales relative to the global sales can be explained by better sales in Europe and increased opportunities in South America and India.

O.2.2. Citroën

In comparison with Peugeot, Citroën's rising domestic market share was due to the introduction of new models, e.g. the AX in 1986 and the ZX in 1991, which strengthened the market position in 1987 and the following years to 1991. In fact, a potential falling domestic market share of Citroën was compensated by the introduction of the ZX model.

Citroën's increased global sales relative to national sales is explained by the same factors as for Peugeot: increased sales in Europe and the conquering of new market shares in South America and India.

O.3. BMW

The influences affecting the market position of BMW – national and international – were especially caused by new model launches and the changes in the national/international levels of competition. The sales of BMW do not depend significantly on relative market conditions because of its high price segment. In addition, two thirds of all BMWs are company cars. Nowadays, BMW sells about one third of its cars in Germany, one third in other European countries and the rest of its sales are non-European.

The SMP had positive as well as negative effects on BMW as restrictions decreased, but bureaucracy increased. Nevertheless, the SMP is perceived as having a positive effect for BMW. The pricing policy was not changed in the analysed period.

O.3.1. Domestic market share

As far as BMW's domestic market share is concerned, it suffered in 1985 from Mercedes-Benz having a big success with its new E-series that year. The downward trend between 1986 and 1991 was due to the expiring of the old BMW 3-series. The trend was turned around in 1991 through the introduction of the new 3-series.

O.3.2. Domestic sales as a proportion of total global sales

The increasing proportion of national sales between 1985 and 1991 was caused by sales decreasing in the USA. This can be explained by the devaluation of the Dollar and other restrictions like the luxury tax. Indeed, the highest American sales for BMW were in 1986. The reunification of Germany influenced BMW in 1990, where bad international sales were compensated by sales to former East Germany. From 1991 onwards, Japanese and American sales went up and thus also BMW's relative market share.

APPENDIX P

Micro Compact Car (MCC) – a co-operative venture between Mercedes-Benz and SMH 'Swatch-Mobil', 'Smart Mobil'

In the beginning of 1994, a co-operative venture between Mercedes-Benz (51%) and Schweizerische Gesellschaft für Mikroelektronik und Uhrenindustrie AG (SMH) (49%) was announced to build an innovative, small and light vehicle designed especially for densely populated urban areas, called the Micro Compact Car (MCC).

According to the annual report for 1994 of Mercedes-Benz, the MC Micro Compact Car AG (MCAG), with headquarters in Biel, Switzerland, is responsible for carrying out this project. The preparations for development and production are carried out in Renningen, Germany. Production will be based in Hambach, France, near the German border. The first Smart cars will be sold in 1999.

The decision to produce in Lorraine, France, was based on market policy considerations as well as advantages in logistics and the anticipated production costs. The great flexibility in organizing working time and the internationally competitive level of wages provide a solid basis for attractive pricing for the MCC, especially in this price-sensitive sector. According to MC AG, relatively cheap ground prices and the quick procedures of French construction permissions, as well as significant subventions from the French Government influenced the decision to produce in France. Among 37 potential production sites, Europol (an industrialized region in France) was chosen as the best one. The conclusion of the Tariff Agreement, apparently, did not seem to have been important.

Prior to the decision on the production site location, an aggressive public discussion (closely followed by the newspapers) between the companies concerned and the government/union (IG Metall) was held in Germany. The question was whether to produce in Germany or France. Both companies, Mercedes-Benz and SMH, would prefer to produce in Germany, but only under better, more efficient conditions for production. Naturally, Germany as the production site was favoured by the government and the union as an opportunity to produce new jobs. Negotiations and compromises towards the companies were nearly impossible.

In addition, the discussion between both parties (companies and German institutions) was held during new tariff agreements (IG Metall). As these did not end very satisfactorily for the companies, a decision was taken in favour of France.

APPENDIX Q

Case study on Nissan

Q.1. Introduction

Nissan is Japan's second largest manufacturer of motor vehicles and the fifth largest in the world. It produces some three million vehicles per annum that are marketed in 170 countries. In Europe, it offers direct employment to 16,000 people and has 4,300 dealers. Europe represents approximately 28% of its total non-Japanese unit sales. It has two manufacturing operations in Europe – in the UK and Spain. Two-thirds of its sales in Europe are sourced in Europe.

Nissan's European operations are summarized in the table below:

Table Q.1. Overview of the company's European structure

Name	Activity
Nissan Europe NV, Amsterdam	European Headquarters
Nissan Motor Parts Centre (Europe) BV, Amsterdam	Responsible for Europe-wide distribution of parts and the development and distribution of accessories. Holds over 114,000 parts and 500,000 registered items.
Nissan Distribution Service (Europe) BV, Amsterdam, Barcelona, Tyneside	Responsible for vehicle distribution across Europe, as well as vehicle storage, pre-delivery inspection, portside installation of parts and final delivery.
Nissan European Technology Centres	Based in Cranfield, Sunderland and Louvain-la-Neuve. UK activities include planning, design and development of vehicles produced in Europe, vehicle and engine testing, and support to European manufacturing operations. The Belgium centre focuses on homologation issues.
Nissan Design Europe GmbH	Located close to Munich, NDE is involved in internal and external design of future generation Nissan vehicles.
Nissan Motor Manufacturing (UK) Ltd	£1.25 billion investment in Sunderland in the UK. Production of Micra and Primera.
Nissan Motor Iberica SA	Largest of Nissan's Spanish production plants. Centre for production of Terrano II, Patrol, Serena, Vanette Cargo. An R&D department is also included.
Nissan Forklift España	Located in Noain, Spain, making forklifts for Europe and other markets.
Nissan Vehiculos Industriales	Based in Avila, Spain. Responsible for the design, manufacture and sale of commercial and industrial vehicles.
Nissan Motorsports Europe	Based in Didcot, UK. Supports Nissan distribution and private Nissan customers participating in motorsport activities in / around Europe.

Nissan also owns its distributors in seven European countries (Germany, UK, France, Spain, Italy, Netherlands and Switzerland).

Our case study was carried out during 1995/96 and involved high level interviews with the vice-president for manufacturing, the vice-president of marketing and the director of business development. Due to resource constraints within Nissan, we were unable to speak to other senior managers. However, Nissan has been very co-operative and we believe we have gained sufficient insight into the company to ascertain its views on the effects of the single market programme and the future actions that are now required.

Nissan was chosen for a number of reasons:

(a) It first entered the European market in the 1960s, and during the 1980s has made major investments in manufacturing facilities in the region. Its attitude to the EU in terms of market entry and plant location are therefore very different from indigenous European firms.
(b) It is a global player. Its attitude to Europe can therefore be compared with its strategies towards North America.
(c) It pioneered the introduction of a number of new elements to the European automobile industry, such as lean manufacturing techniques, simultaneous engineering and common terms and conditions.

Q.2. Background to the company

Q.2.1 Nature of products

The table below shows a breakdown of the company's product portfolio in Europe.

Table Q.2. Retail sales of main models in Europe, 1993–95

Model	1995	1994	1993
Micra	139,419	139,678	117,494
Primera*	92,622	103,676	103,065
Sunny*/Almera	86,756	95,077	110,661
Terrano II	22,754	23,195	10,581
Serena	18,958	17,788	15,566
Total	360,509	379,427	357,367

Source: Nissan 1996 Fact Sheet.
* Includes Wagon.

Other models sold include the Patrol, Tirade, Sunny van, 200 SX, 300 ZX and 100 NX.

Q.2.2. Geographic markets

Nissan's entry into Europe started in the 1960s and it is important to understand the reasons behind Nissan's tactical decisions to sell into various markets over time, and its decisions to set up plants to serve the more protected markets. Annex C provides an overview of the key milestones in Europe for the company and the reasons for its entry into each market.

The table below shows a breakdown of sales and market shares in the 16 major markets of Europe using registration figures.

Table Q.3. Nissan's vehicle registration figures and market shares in Europe, 1993–95 (16 major markets)

Type	1995	% change	1994	% change	1993	%
Passenger cars	370,717	3.1	390,179	3.3	397,688	3.5
Light commercial vehicles	69,389	5.4	68,510	5.7	72,355	6.4
Total	440,106	3.3	458,689	3.5	470,043	3.8

Source: Nissan 1996 Fact Sheet.

Table Q.4. Nissan's unit sales over time (financial years)

	1995	% change	1994	% change	1993	% change	1992	% change	1991
Global unit sales	2,699,774	0.32	2,691,168	-4.33	2,812,880	-3.91	2,927,305	1.53	2,883,094
of which Europe	460,222	-2.82	473,556	-14.02	550,794	4.28	528,183	5.09	502,587
% represented by Europe	17		18		20		18		17

Source: 1995 Annual Report.

Europe's percentage of Nissan's global sales peaked in 1993 at 20% but has subsequently declined to 17%. The table also shows the relative depth of the recession (in retail demand for vehicles) in Europe between 1993 and 1994, with a 14% drop in sales in Europe compared with a fall of only 4% globally.

Table Q.5. Nissan's top five European markets, 1994–95

Country	1995 registrations	1994 registrations	1995 Market share (%)	1994 Market share (%)
Germany	93,353	101,005	2.7	3.0
UK	97,084	96,772	4.5	4.6
Spain	49,040	53,241	4.8	5.0
Italy	52,000	50,983	2.9	2.9
France	35,912	34,050	1.6	1.5

Source: 1996 Annual Report.

The largest proportions of European sales are in Germany and the UK. Nissan appears to have a much larger market share in the countries in which it has manufacturing facilities – 4.6% in the UK and 5% in Spain. It is interesting to note that neither of these countries have strong, locally owned manufacturers.

Q.2.3. Number and location of plants

As already stated, Nissan has two manufacturing bases in Europe, one in the UK and the other in Spain:

(a) Nissan Motor Manufacturing (UK) Ltd is Nissan's European production plant for passenger cars. It makes the Micra and Primera models. Cumulative production exceeded one million units in 1995. The plant was established in 1984 in Sunderland and cumulative investment has since reached ECU 1.5 billion. In 1993, it was the largest exporter of passenger vehicles from the UK. In 1994, of the 205,195 cars produced, the Micra represented 64% and the Primera 36%. In 1995, of the 215,346 vehicles produced, the Micra represented 58% and the Primera 42%.

(b) The operations in Spain are made up of the following: Nissan Motor Iberica SA (4by4, multi-purpose and light commercial vehicles); Nissan Vehiculos Industriales SA (commercial and industrial vehicles); and Nissan Forklift España. The main models made in Spain include the Patrol, Serena, Terrano II, and Vanette. The main plant was originally a Ford plant making tractors, trucks and diesel engines. Nissan acquired an equity interest in 1980 and became a majority shareholder in 1982. In 1995 it produced 121,863 vehicles of which the Terrano II and Maverick represented 30%, the Mistral (a version of the Terrano II for the Japanese market) 13%, the Serena 18%, and the Vanette Cargo 17.5%. Two thirds of the Spanish output is sold to other European markets.

All Micra, Primera, Serena, Terrano II/Maverick, and Vanette Cargo models sold in Europe are sourced at these plants.

Exports outside Europe amounted to some 26,558 units in 1995.

Q.2.4. Trends in units produced

Figure Q.1 shows the total units produced in Europe over time.

Figure Q.1. Units produced

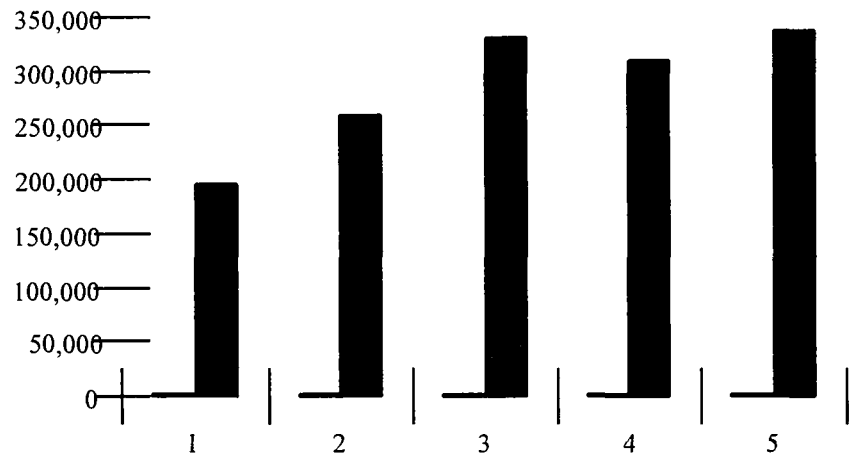


Table Q.6 shows the number of vehicles produced in the UK and Spain over time.

Table Q.6. Trends in units produced

Year (calendar)	UK	Spain	Total in Europe
1991	124,664	72,446	197,110
1992	179,005 (+44%)	79,674 (+10%)	258,679
1993	246,285 (+38%)	84,055 (+5%)	330,340
1994	205,795 (-16%)	104,412 (+24%)	310,207
1995	215,346 (+5%)	121,863 (+17%)	337,209

Source: Nissan 1996 Fact Sheet.

The output from Nissan's European manufacturing plants has grown significantly, especially considering the recent recession.

Q.3. Effects of the single market on market access

Q.3.1. How sales outside the domestic market have changed over time and the reasons for this

Nissan views Europe as one of its regional markets. This subheading (which has been used in the other case studies) is not relevant for Nissan, because it does not consider any one European country as a 'domestic' market.

Q.3.2. Launch of new models for the whole European market and the reasons behind this

Nissan offers its products to the whole of Europe. It sells six main models into the European market, compared with a total of around 20 major models across the globe. In total, there are 26 models (passenger cars, light commercial vehicles and trucks) for the European market, from the 40-plus model types available globally.

Typically, new models are launched using a pan-European marketing campaign, often (but not always) with a common advertising theme. For example, the Almera launch advertising campaign was shown in France, Germany, the Netherlands, Spain and the UK. However, smaller campaigns are organized by the national distributors, usually with the national operation of the same advertising company (TBWA/Omnicom).

Q.3.3. Relative effects of recession and exchange rates on the levels of access to other European markets

Nissan said that its strategy towards Europe and particularly its development of production facilities had little to do with the appreciation of the Yen. The Yen only began to appreciate with the Plaza Accord in 1986 and at that time the level of appreciation was not significant. The main appreciation of the currency occurred from 1992 onwards. Nissan's global manufacturing strategy was much more heavily driven by the structural change of the world automotive market due to the second oil shock and the experience of automobile trade friction during the 1970s than by exchange rate fluctuations.

However, it informed us that the devaluation of the Lira has had a significant effect. It traditionally develops pricing strategies through negotiations with the country distributors, but considers a basket of competitor car prices. If the pricing strategy was left at the current level, Nissan's distributors in southern Germany, Austria and France would be put under serious financial difficulties, because customers would want to parallel import from Italy. To avoid this problem, Nissan has changed its pricing strategy in Italy so that market share growth is less likely.

Q.3.4. Implications of different tax regimes on market access

Nissan mentioned that the French, Spanish and to a lesser extent, the UK and Italian governments encourage the use of diesel engines. This imposes extra costs on the company. However, quantification of these extra costs was not possible. Italy, Spain and France have progressive taxes based on the cubic capacity of engines. The French system also uses a formula which links the tax to the final drive ratio. The German tax system is less progressive, but Germany has different insurance breaks which are dependent on the horsepower of the engine. This means that Nissan has to make a 90HP 1.6 litre engine for the German market compared with the 102 HP variant sold to the rest of the EU.

Q.3.5. Introduction of pan-European marketing and distribution networks and the effect of the block exemption on this

Nissan said that at the period of market entry, the setting up of an effective sales network was one of its most difficult problems, particularly under the block exemption system. However, it considered that it was also normal for a newcomer to make more of an effort than indigenous players. Taking into account the technical/technological complexity of modern cars, Nissan believes that the block exemption system is still very crucial for providing high quality services to end-users.

Nissan also considers that the block exemption system is favourable to manufacturers. For example, unified shop designs, colour schemes, Customer Interface (C.I.) etc. would be extremely difficult to put in place if the block exemption did not exist.

Q.4. Production costs and productivity

Q.4.1. Changes in production costs

The company was unable to provide us with any trend data on its production costs.

Q.4.2. Changes in productivity

Productivity targets have been 10% increases per annum in the UK. They have achieved this in 1994, 1995 and 1996. Of the 10%, 7–7.5% is from process improvements, the rest is through design changes. Future targets are 10%, 8% and 7% over the next three years.

In the financial year to March 1993, Nissan recorded a pre-tax loss of YEN 56 billion on net sales of YEN 6,197 (down from YEN 6,418 in 1992). This led to a strategy to improve cost efficiency including an objective to improve the productivity of manufacturing operations by 10% during the three-year period from 1994 to 1996.

Q.4.3. New methods of working

Nissan is at the forefront of adoption of lean production techniques. It is now embarking on a global strategy by positioning itself in strong sub-sectors of the market. Nissan intends to harmonize its engines, drives and chassis on a global basis, but retain different production structures within each region. Nissan is also attempting to halve the number of platforms it has from the current 26, in order to achieve economies of scale at the global level.

Q.4.4. Effect of the single market on productivity and production changes

Nissan does not view the single market as having affected their productivity and production changes.

Q.5. Employment

Q.5.1. Changes in employment levels

Nissan does not believe that the single market has had an effect on employment levels.

Q.5.2. Changes in conditions of employment

Nissan does not believe that the single market has had an effect on employment conditions.

Q.5.3. Degree of cross-border recruitment

Nissan does transfer employees across the EU, although this is more for the dissemination of information and development of the workforce than as a result of the single market programme.

Q.5.4. Effect of the single market on employment levels and conditions

Nissan does not believe the single market has had an effect on their employment levels or conditions.

Q.6. Manufacturing plants

Q.6.1. Overview of the location and size of plants over time

Nissan sells six models to the European market. Table Q.7 shows where each of these is made and puts Nissan's European product market strategy in a global context.

Table Q.7. Production of vehicles for the European market

Product	Made in Japan	Made in USA	Made in Europe	Sold in Japan	Sold in USA	Sold in Europe
Micra	Yes (March)		Yes	Yes (March)		Yes
Almera	Yes (Platform used is global)	Sentra uses platform		Yes (Pulsar)		Yes
Primera	Yes		Yes	Yes (some are imported from EU)		Yes
Maxima QX	Yes			Yes	Yes (Maxima)	Yes
Terano II			Yes	Yes (Mistral) (Exported & pan EU)		Yes (sold to Ford as Maverick)
Serena/Van-ette Cargo	Yes (Serena only)		Yes	Yes (Serena only)		Yes

Source: Nissan.

In addition to the above six models, Nissan manufactures a significant number of other models for the US and Japanese markets.

Q.6.2. Reasons for any international relocations

Nissan has not relocated as such, but has developed new European sites to manufacture and distribute its vehicles:

(a) In 1980, Nissan purchased a stake in the Spanish manufacturer Motor Iberica, a manufacturer of tractors, vans and trucks. Nissan said that this move was part of their globalization strategy. This strategy was for the Spanish manufacturing base to become one of the key bases for commercial vehicles and 4X4s, firstly for the EU market and then for the global market. The plant was owned by Massey Fergusson which was experiencing financial difficulties at the time. The plant was exporting to France and Italy. At that time, Nissan attempted to sign a joint venture with Alfa Romeo (the Arna project), but ultimately this was short-lived. It decided to set up the new plant in Sunderland, UK, after it had researched a number of other potential sites: Spain, Portugal, Belgium, Northern Ireland, the French/Belgian border region, and southern Italy.

(b) In 1984, Nissan Motor Manufacturing (UK) Ltd was established on a greenfield site in Sunderland. Nissan was keen to increase its local production based on its philosophy of localization: NMUK endeavoured to increase local content to 60%. At this level, NMUK products could be treated as being of UK origin according to the EU rules. In 1988, when this criteria was achieved, NMUK products were freely circulated on the EU market. However, in line with Nissan's above-mentioned philosophy, NMUK was not satisfied with local content of 60% and, in 1992, local content passed 80%.

(c) In 1989, Nissan Europe NV was established in Amsterdam. The Netherlands was already home to vehicles and parts logistics operations and had been key in controlling the logistics of imports from Japan for the rest of Europe. The Netherlands therefore had a large stock-yard. The UK, Belgium and Germany were other options for the location of the European head office.

Table Q.8. Number of suppliers, UK manufacturing plant, 1995

Country	Number of suppliers	Percentage
UK	134	67
Germany	24	12
France	17	8.5
Spain	12	6
Belgium	3	1.5
Ireland	4	2
Italy	2	1
Portugal	2	1
Austria	1	0.5
Switzerland	1	0.5
Total	200	100

Source: Nissan Fact File, 1996.

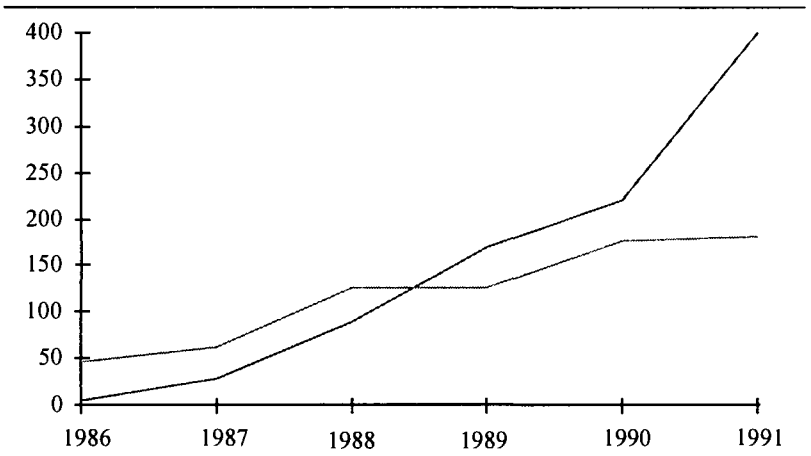
Q.7. Purchasing

Q.7.1. Numbers of suppliers used and their location over time

In 1994, Nissan had 198 suppliers for the UK plant and 241 for the Spanish plant. Thirty-nine suppliers are common to the UK and Spanish plants, and this number is increasing. The locations of suppliers for the UK operation are shown in Table Q.8.

Figure Q.2 shows the growth in numbers of suppliers and the expenditure on components over time (by 1991: components expenditure ECU 400 million; number of suppliers 150+).

Figure Q.2. Growth in numbers of suppliers and expenditure



European components expenditure has been rising steadily throughout the period. The main increases in the number of suppliers came between 1987 and 1988 and between 1989 and 1990.

Nissan has warehousing and vehicle and parts distribution operations in Amsterdam as well as further vehicle distribution centres in Tyneside, UK, Barcelona, Spain and Le Havre in France. It has a three to four month stockholding of vehicles which it views as about average in the industry.

Q.7.2. Examples of changes in cross-border sourcing

In 1994, Nissan had 198 suppliers for the UK plant and 241 for the Spanish plant. Thirty-nine suppliers are common to the UK and Spanish plants, and this number is increasing. Components expenditure in Europe has increased from around UK £50 million in 1986 to UK £200 million in 1995. The number of European component suppliers has increased from zero in 1986 to around 750 in 1995. When Nissan entered the EU market it used indigenous sources of supply because of different customer requirements in the EU as opposed to Japan. It considered the best way to meet these requirements was to use indigenous component supply. Since entry Nissan has actively encouraged the component suppliers to adopt new techniques and to improve efficiency.

Q.7.3. Effect of exchange rates on sourcing decisions

Nissan does not feel that there has been an effect on their sourcing decisions.

Q.7.4. Views on and examples of the internationalization of supply base

Nissan does not feel that there has been an effect on their sourcing decisions.

Q.7.5. Effect of the single market on these changes

Nissan does not feel that there has been an effect on their sourcing decisions.

Q.8. Research, design and development (RD&D)

Nissan's European Technology Centres (NETCs) operate from bases in the UK and Belgium and represent a total investment of ECU 78 million. The UK centre in Cranfield was established in May 1988 and has a workforce of 330. The Belgian operation was established in July 1989 and its Louvain-la-Neuve base has a workforce of 59. In addition, Nissan Design Europe GmbH was established near Munich in 1992 and has a current workforce of nine.

Activities at Cranfield include the design and development of complete vehicle styling, body chassis, electrical and trim design, component and engine testing, trial vehicle building and project control.

Q.8.1. Estimation of cost savings from the component type approval measures

Nissan was unable to quantify the cost savings resulting from the component type approval measures.

Q.8.2. Estimation of cost savings from the whole vehicle type approval measure

Nissan's national distributors used to obtain type approval for new models on a national basis supported by the homologation department in Japan. By 1985, Nissan had created an additional homologation department in the UK. This department formed a relationship with the Vehicle Certification Agency in Bristol. In 1991, when NETC UK was established, this department was incorporated into it. In 1993, Nissan established NETC Brussels (in Louvain-la-Neuve) and the planning and co-ordination process is carried out in association with NETC UK and other related Nissan operational bases.

Nissan has obtained Whole Vehicle Type Approval for the whole of Europe for two of its models (even though the Directive does not require this until 1996/98). The number of staff in this area has been reduced from 14 to 4 – primarily as a result of not having to comply within each EU country.

The cost savings from the Whole Vehicle Type Approval for passenger cars arise from two areas:

(a) The need to present a car for inspection only once rather than 15 times – saving the cost of 14 prototype cars.
(b) The speed of the process which means that the car used for the inspection can come off the manufacturing line rather than at an early prototype stage. This saving is significant. Nissan stated that Germany used to require six months to obtain type approval (the longest lead time) versus three to four months in the UK (the shortest). The difference in costs between a prototype and a production vehicle amounts to tens of thousands of ECU per vehicle.

Our calculations suggest that the Whole Vehicle Type Approval has resulted in cost savings of around ECU 1 million per new model.

Q.8.3. Key changes taking place in RD&D (particularly joint design with suppliers)

When developing a new model, Nissan initially decides where the market is likely to be for the new product concept. It breaks its markets into four: Europe, America, Japan and the Far East. Products can be marketed to just one market or more than one. Products just for the European market are likely to have their RD&D activities and production carried out in Europe. Products for both Japan and Europe are likely to have their design, development and production shared between these two regions.

The three main RD&D centres are NETC (with 398 engineering staff) in Europe, NTC in Japan (with 6,600 engineering staff) and NRD in the USA (with 500 engineering staff). The three centres all use the same CAD/CAM technology. Nissan is also helping in the development of technical standards in the use of CAD/CAM technologies, e.g. STEP (Standard for Exchange Specification) and IGES (Initial Graphics Exchange Specification). It also has its own proprietary translators that it offers to its suppliers.

Nissan believes that the way in which it structures research, design and development is unique. It has developed three different models for sharing design:

(a) *Localization* – the principal design and development is carried out in Japan and local changes are made to adapt the vehicle to European specifications for components. This happened in 1986 during the development of the Bluebird. For this model, it took 2.5 years of localization to reach 60% local content. The localization of design is necessary because of the differences in materials, standards and customer requirements. For example, the standard for the thickness of Japanese glass is different to that in Europe. This necessitates changes to the rubber mouldings and fittings for the European model. Similarly, battery capacities are much higher in Japan (to provide power for more electric add-ons) and localized design and development is started at the same time. This was the case for the Primera and the Micra. They achieved around 80% local content of the European versions at the time the car was launched in both Japan and Europe.
(b) *Sole but facilitated development* where there is no 'mother' development in Japan. An example of this approach was the development of the Terrano II/Maverick, or the Vanette Cargo. However, the approach uses common components from other models, such as engines and gearboxes.
(c) *Sole development* where there is no mother development and all of the components are newly designed. This has not yet been tried.

Development of new products entails a number of discrete processes:

(a) styling,
(b) layout design,
(c) body in white,
(d) prototyping,
(e) purchasing,
(f) engineering.

Each stage can be carried out at different locations. For example, the Terrano II was styled by an Italian design house. NETC in the UK designed the layout, and prototyping was carried out in Spain, where the model is also manufactured.

Q.8.4. Effect of the single market programme on these changes

Design and development is increasingly delegated down to suppliers. However, this originated from Nissan's own policy on relations with suppliers (i.e. simultaneous engineering) and not as a result of the single market programme.

Q.9. Business strategy

Q.9.1. Key alliances developed

NRD in the USA designed the CR truck which is manufactured by Ford.

In Europe, NETC designed the Terrano II which is the same as the Ford Maverick. Both are made at Nissan's Spanish site and exported. The exports to Japan are rebadged as the Mistral.

Q.9.2. Changes in business process strategy

Purchasing

In 1994, Nissan had 198 suppliers for the UK plant and 241 for the Spanish plant. Thirty-nine suppliers are common to the UK and Spanish plants, and this number is increasing. Components expenditure in Europe has increased from around UK £50 million in 1986 to UK £200 million in 1995. The number of European component suppliers has increased from zero in 1986 to around 750 in 1995. When Nissan entered the EU market it used indigenous sources of supply because of different customer requirements in the EU as opposed to Japan. It considered the best way to meet these requirements was to use indigenous component supply. Since entry Nissan has actively encouraged the component suppliers to adopt new techniques and to improve efficiency.

Manufacturing

Nissan's plant in Sunderland has a number of interesting strategic features:

(a) All staff share the same terms of employment, the same canteen and health care schemes. They are all salaried and there is a single union agreement with the AEEU.
(b) Eight major suppliers who manufacture components simultaneously have plants alongside the Sunderland site.
(c) The engine building facility produces around 50 different variants on a single moving line.
(d) Body assembly is highly automated and uses 250 robots carrying out 80% of all the necessary body welds.

Sales and distribution

Nissan began to set up its European sales and distribution infrastructure in the mid-1960s. In 1964, it set up a liaison office in Brussels to facilitate this process. By 1966, it had appointed importers for the Netherlands, Belgium, Sweden, Denmark and Switzerland. In the late 1960s and early 1970s, distributors had been appointed in the UK and Germany. The development of the distribution network was based on the policy to start selling vehicles into each market as the quota controls were removed.

RD&D

The technology centre at Cranfield has participated in three major projects, and its role in Nissan's overall RD&D has become increasingly important. For example, the technology centre had more input into the development of the Micra. Almost all the components and subassemblies were locally designed with the suppliers to meet European standards and conventions. Finally, the Terrano II project was led by the technology centre to meet a marketing brief from Nissan's European headquarters in Amsterdam.

Q.10. Views on future EU actions to help the sector

Q.10.1. Type approval

Nissan's main frustration with the type approval system was that they were constantly trying to forecast future standards, e.g. future standards for the height of the front bumpers on trucks which affect the heights of the reinforcement bars on car doors.

These problems have become worse as a result of:

(a) the time required to translate documents into 14 languages, prolonging the agreement process;
(b) possible delay of role-making due to the involvement of the European Parliament in the process.

Standards between the US and Japan are coming closer together, but the EU is lagging behind. Nissan has been thinking about introducing a US version of the Primera. However, the differences in standards between the EU and the US are likely to mean that this will be too expensive. Importantly, the large and growing Asian market is likely to follow US standards. Nissan believes that the EU should do the same, given the size and potential of the Asian market.

Q.10.2. Different global emissions standards

Different global emission standards require different engine sizes for the European and Japanese markets. Nissan gave us an example of the Almera and Maxima QX models which are sold in 1.3, 1.5 and 1.8 litre varieties in Japan and 1.4 and 1.6 litre varieties in Europe.

Emissions standards are the same around Europe. However, Germany is considering the provision of tax incentives for consumers to purchase cars conforming to the next emissions stage. Nissan may therefore have to produce cars for Germany with a larger catalyst than that required for other EU Member States.

Q.10.3. Effect of different tax structures across the EU

The French, Italian and, to a lesser extent, the UK governments encourage the use of diesel engines. This adds extra costs for Nissan.

Nissan mentioned that Italy, Spain and France have progressive taxes based on the cubic capacity of engines. The French system also uses a formula that links the tax to the final drive ratio. The German system is very different and has different insurance breaks which are dependent on the horsepower of the engine. This means that Nissan has to make a 90HP 1.6

litre engine for the German market, compared with the 102 HP variant sold to the rest of the EU.

Single European currency or at least fixed exchange rate

Nissan are in favour of the single currency (or at least the re-entry of all EU Member States into the ERM). Its dealers in the countries bordering Italy have been adversely affected by the devaluation of the Italian Lira and a single currency (or currency stability) would minimize these problems.

Q.11. Annex

Q.11.1. List of persons interviewed

Peter Slater, Vice-President, Marketing, Amsterdam
Ken Foxley, Director of Business Development, Cranfield

Q.11.2. Articles/other information used

Nissan Annual Reports;
Nissan Fact Sheets;
Nissan's European Localization Strategy by the Strathclyde International Business Unit;
Nissan in Europe – Designing, developing, manufacturing and selling cars in Europe (produced by Nissan);
Nissan European Technology Centre (produced by Nissan);
Symbiosis – Towards the Harmonious Coexistence of People, Automobiles and Nature (produced by Nissan);
Nissan in Britain (produced by Nissan);
Nissan cars (produced by Nissan).

Q.11.3. Key milestones in Europe

1960–62

Nissan started exporting Datsun Bluebirds into Norway and Finland. By 1962, 713 had been exported to Finland. These countries were chosen because an independent local distributor was strongly interested in commercializing Nissan cars on his market. (NB: At that period Japanese cars had not yet established their good reputation and quotas/restrictions had not been raised.)

1964

Nissan opened a liaison office in Brussels. This acted as a centre for signing up importers/distributors in the key markets.

1966

Importers for the Netherlands, Belgium, Sweden, Denmark and Switzerland were appointed. At around the same time Ford closed its CKD plants in Sweden, Denmark and Switzerland. (NB: Concerning the Ford plant in Portugal, Nissan questions the date of closure of this plant – perhaps the date should be checked with Ford.)

1968

Nissan started exporting to the UK and France.

1972

Nissan began to export to Germany.

1980

Nissan purchased a stake in the Spanish manufacturer Motor Iberica, a manufacturer of tractors, vans and trucks. The Spanish plant had been owned by Massey Fergusson and prior to that by Ford. The plant was already exporting to France and Italy.

Nissan signed a joint venture with Alfa Romeo (the Arna Project). This project was short-lived.

Manufacturing for the local market also commenced in the USA. The 1978/79 oil shock had led to a surge in Japanese imports to compete with the larger US models. This increase led to a 'Voluntary Restriction Agreement' and therefore created the incentive for Nissan to invest in the USA. Nissan started this process slightly later than Honda and Toyota when it set up the Smyrna plant in Tennessee.

1983

The Spanish production facility manufactured its first Nissan model – the Nissan Patrol.

Nissan Motor Parts Centre started operations.

1984

Nissan Motor Manufacturing (UK) Ltd was established on a greenfield site in Sunderland.

1986

The UK plant started producing the Nissan Bluebird.

1988

Nissan established its European Technology Centre in the UK.

1989

Nissan Europe NV was established in Amsterdam.

1991

Nissan's Amsterdam based headquarters became fully operational.

First shipments of European built Primera models to the Far East.

1992

The UK plant began production of a second model – the Micra.

Nissan Design Europe was established in Geretsried, near Munich.

Nissan European Technology Centre opened in Cranfield, UK, in order to accommodate larger design/development facilities needed to support a more unique European product range.

1993

The Nissan Micra was voted the European Car of the Year.

1994

Nissan's technology centre in Brussels moved to new custom-built premises near Louvain-la-Neuve.

First Spanish-built Mistrals (Terrano II) exported to Japan.

1995

First exports of UK built Micra models to Australia.

Nissan launched the Maxima QX and the Almera.

APPENDIX R

Case study on Volvo

R.1. Introduction

Volvo started making cars in 1927 and commercial vehicles in 1928, initially for the domestic market in Sweden. It still retains both car and commercial vehicle divisions (VCC and VTC respectively) and, following a recent reversal of past diversification decisions, over 85% of group turnover comes from the automotive sector. Volvo has related interests in marine engines (Volvo Penta) and aircraft engines (Volvo Aero) as well as construction equipment (VME).

Volvo was selected as a case study for several reasons. First, it has both car and commercial vehicle production interests. Second, it is representative of an important segment within European car production – that of the 'specialist' producer. Third, while the company HQ is in Sweden and hence the company is in theory a recent entrant to the European Union (EU), Volvo has retained production facilities within the EU for many years. Fourth, partly out of necessity because of the small domestic market in Sweden, Volvo has long sustained a strong international orientation. Lastly, Volvo has recently disentangled itself from a cross-shareholding with Renault – an episode which clearly illustrates the potential difficulties of corporate rationalization in the European Union.

The case study is based upon a series of intensive interviews at VCC and VTC in Sweden, including staff from the Volvo AB group headquarters. Supporting documentary information was provided by Volvo, and supplemented with published sources. It is important to note that the interviews were conducted relatively early in the overall research programme (in 1995), as opposed to the other case studies which were conducted after the overall research programme had been completed. The Volvo case study therefore was conducted partly to inform the overall research process in advance, rather than check the findings at the end of the research.

R.2. Company background

R.2.1. Products

VCC produces cars in the medium and large segments together with a range of engines. The products are shown in the table below.

Table R.1. VCC products

Model	Engine size	Year introduced	1994 production
960	1.9–2.9	1990	23,400
940	1.9–2.3	1990	69,700
850	1.9–2.4	1991	166,500
440	1.5–1.9	1988	47,400
460	1.5–1.9	1989	41,900
480	1.7–1.9	1986	2,800

Source: Volvo AB.

400 series, produced at Born in the Netherlands. Medium segment saloons and hatchbacks, now being phased out with the introduction of the joint venture production of the Mitsubishi Charisma/Volvo S4.

800 series, produced at Torslanda in Sweden and Ghent in Belgium together with a small assembly plant at Halifax in Canada. Large segment saloons and estates.

900 series, also produced at Torslanda in Sweden. Large segment saloons and estates.

A large number of variants are produced, with high levels of additional equipment. VCC also produces petrol and diesel engines together with gearboxes, brake discs, axles, and various castings.

VTC is the world's second largest producer of heavy trucks, bus chassis and completed buses (i.e. over 15 tonnes GVW (Gross Vehicle Weight)), together with the associated engines and gearboxes. The basic range is shown in the table below.

Table R.2. VTC's products

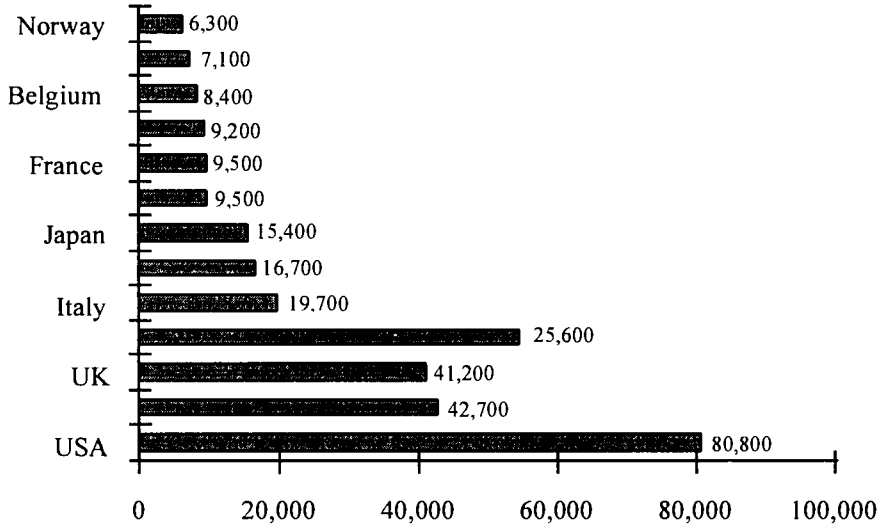
Model	GVW	Year introduced	1994 production
FL6/FE	8.6–18.0	1985	7,150
FS7/FL7/FL10/FS10/ FL12	18.0–42.0	1985	7,700
F10/F12/F16	19.7–41.0	1977	3,700
FH12/FH16	20.0–41.0	1993	16,550
NL10/NL12	19.7–32.7	1989	7,600
WhiteGMC	n.a.	n.a.	26,490

Source: VTC.
NB: White GMC production in the US – since July 1995 all white GMC trucks built here will carry the Volvo brand name.

R.2.2. Geographic markets

Figure R.1 shows VCC's largest markets in 1994.

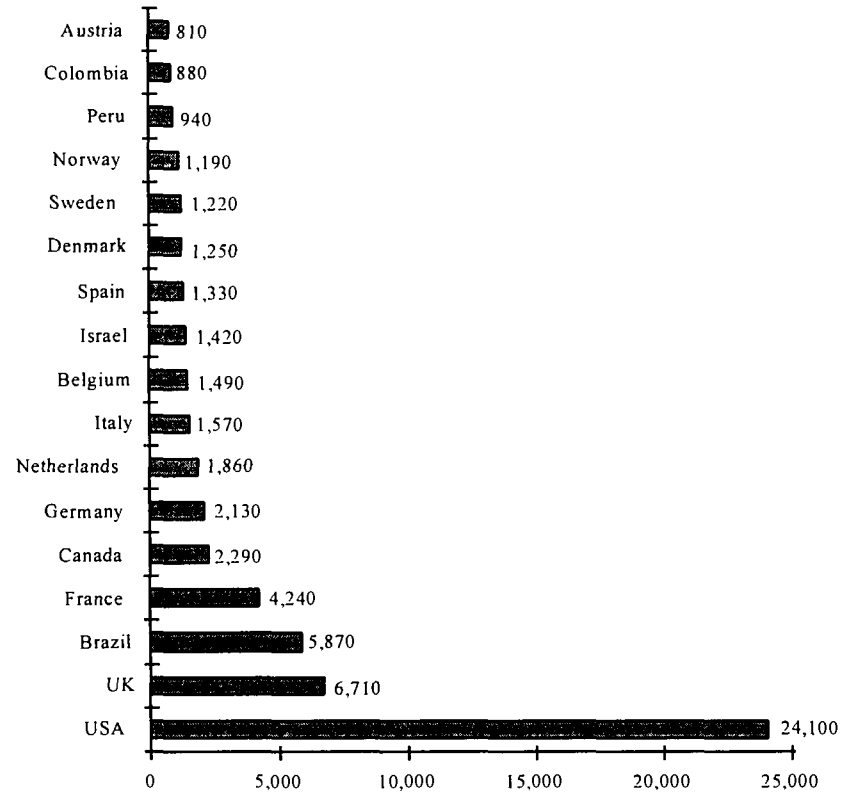
Figure R.1. VCC's markets in 1994



Source: Volvo AB.

VTC's largest markets in 1994 are shown in the figure below.

Figure R.2. VTC's markets in 1994



Source: Volvo AB.

In the case of VCC, it is only recently that in the domestic market in Sweden Volvo has sold more cars than in the UK. In the case of VTC, it can be seen that the domestic market is residual.

R.2.3. Number and location of plants

Table R.3. VCC plants world-wide, 1994

Location	Employment	Product	Output
Torslanda, Sweden	6,300	800/900 series	98,700
Olofström, Sweden	3,900	Body parts	n.a.
Skövde, Sweden	2,550	Engines, discs	n.a.
Köping, Sweden	1,100	Gearboxes, rear axles	n.a.
Born, Netherlands	4,300	400 series	92,100
Ghent, Belgium	3,500	800 series	147,600
Halifax, Canada	140	800 series	6,700
Kuala Lumpur, Malaysia	450	CKD	2,300
Bangkok, Thailand	430	CKD	3,600

Source: Volvo AB.
Note: Born plant 33% owned by Volvo.

VCC has three main car assembly plants: Torslanda, Ghent and Born. Components production is concentrated in Sweden. Other plants world-wide produce low volumes, mainly of kit assembled cars. Volvo used to have two further plants in Sweden, at Kalmar and at Uddevalla – both of which produced in low volumes but with innovative production organizations (see discussion under Section R.4 below). The Kalmar plant has been closed. The Uddevalla plant is now a joint venture operation with TWR (of the UK) for the low-volume production of cabriolet and coupe derivatives of their 800 series; output is expected to start in 1997.

Table R.4. VTC plants world-wide (including buses), 1994

Location	Employment	Product	Output
Torslanda, Sweden	1,650	Trucks	11,730
Skövde, Sweden	2,600	Engines, castings	n.a.
Borås, Sweden	290	Buses	3,110
Säffle, Sweden	270	Bus bodies	n.a.
Köping, Sweden	780	Gearboxes	n.a.
Lindesberg, Sweden	620	Rear axles	n.a.
Umeå, Sweden	1,580	Truck cabs	n.a.
Ghent, Belgium	1,500	Trucks	17,920
Irvine, Scotland	1,170	Trucks	3,190
		Buses	1,020
Orville, USA	3,650	Trucks	27,630
Vienna, Austria	250	Bus bodies	n.a.
Lima, Peru	240	Trucks	590
		Buses	160
Curitiba, Brazil	1,500	Trucks	6,010
		Buses	1,290
Kuala Lumpur, Malaysia	35	Trucks	210
Brisbane, Australia	390	Trucks	1,040
		Buses	100
Abenra, Denmark	150	Bus bodies	n.a.

Source: Volvo AB.

VTC has its major truck assembly plants at Torslanda, Ghent and Orville (Texas), together with its plant in Brazil. A new plant at Monterey (USA) started production in 1995. Other truck plants tend to assemble kits produced in the main plants. VTC has been expanding its interests in bus body and bus assembly operations through the acquisition of existing companies. In 1994 for example, Drogmoller GmbH & KG (Germany) and Abenra Karosseri A/S (Denmark) were acquired. VTC also partly owns plants in Iran, Botswana, Morocco and China.

R.2.4. Trends in units produced

Table R.5. VCC production by plant, 1985–94

(000s)

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
Torslanda	166	167	165	150	139	121	73	82	72	93
Kalmar	32	32	29	28	23	18	18	17	19	5
Uddevalla	0	0	0	1	9	16	19	21	4	0
Ghent	73	80	88	91	94	83	69	77	102	147
Halifax	10	10	8	6	8	8	7	6	5	6
Born	109	118	124	115	133	121	84	94	80	92
Total	397	414	423	400	414	376	278	304	290	351

Source: Volvo AB.
Note: Total includes production at other plants.

Table R.6. VTC production by plant, 1985–94

(000s)

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
Torslanda	11.2	14.1	14.2	14.4	14.5	12.7	13.8	9.1	8.7	11.7
Ghent	11.2	12.8	13.8	17.2	17.3	15.5	16.4	12.7	11.1	17.9
Irvine	1.4	2.0	2.4	3.6	3.5	2.4	1.9	2.3	2.5	3.1
Orville	10.7	11.1	11.4	19.9	19.1	16.0	13.7	17.6	22.7	27.6
Total	41.2	44.4	46.5	60.5	60.2	54.9	53.0	46.5	50.9	69.2
Buses	3.2	3.2	3.9	5.5	5.5	4.6	4.7	5.6	5.0	5.7

Source: Volvo AB.
Note: Total includes production at other plants.

In aggregate, trends in units produced for both VCC and VTC reflect changing economic conditions in core markets. Within Europe, both VCC and VTC have seen a relative shift in emphasis over the time period towards production in Ghent, Belgium, over that in Sweden.

R.3. The effects of the single market on access

R.3.1. Sales outside the domestic market

VCC has a global market share of about 1%, and only 1.6% within Western Europe as a whole. Market share is highest in Sweden, at 27.4% in 1994. Sales in key markets are shown below.

Table R.7. VCC unit sales in key markets, 1986–94

(000s)

	1986	1987	1988	1989	1990	1991	1992	1993	1994
Belgium	10.0	9.2	9.0	9.8	9.3	8.4	9.6	6.3	8.4
France	19.3	18.8	17.3	16.6	12.4	8.9	12.1	8.5	9.5
Germany	17.3	17.3	17.5	18.0	17.3	21.9	21.2	20.5	25.6
UK	69.0	70.9	80.4	81.7	66.0	46.7	43.1	43.5	41.2
Italy	16.7	16.3	14.8	15.1	23.0	20.6	22.1	15.7	19.7
Japan	2.3	3.4	4.6	7.1	10.9	10.1	8.6	11.9	15.4
Netherlands	28.7	26.1	21.8	24.1	24.2	21.0	23.2	15.4	16.7
Norway	13.8	9.2	5.0	3.5	3.9	3.2	4.2	4.1	6.3
Spain	2.6	3.4	4.4	5.2	6.1	8.7	10.8	7.6	9.5
Sweden	64.6	72.5	74.6	66.6	47.6	37.9	35.8	33.0	42.7
USA	111.1	105.1	97.8	101.9	89.0	67.2	67.9	72.2	80.8

Source: Volvo AB.

In the period since 1986, the relative market share of VCC in key markets has undergone some change.

Table R.8. VCC market share in key markets, 1986, 1990 and 1994

	1986 % market share	1990 % market share	1994 % market share
Belgium	2.5	2.0	2.2
France	1.0	0.5	0.5
Germany	0.6	0.6	0.8
UK	3.7	3.3	2.2
Italy	0.9	1.0	1.1
Japan	0.1	0.2	0.5
Netherlands	5.2	4.8	3.9
Norway	8.2	6.3	7.4
Spain	0.4	0.7	1.1
Sweden	23.9	20.7	27.4
USA	1.0	1.0	0.9

Source: Volvo AB.

VCC has improved its market share in the domestic market of Sweden, and also shown good growth (albeit from a low base) in Japan and Spain. VCC said that the general improvement in market share and overall volumes from 1991 can be largely attributed to the introduction of the well-received 800 series.

In the case of VTC, which has of necessity been less reliant on the domestic market in Sweden for many years, growth in sales has mainly come from accessing new geographic markets. On a world scale, VTC (including WhiteGMC in the USA) is the second largest producer of heavy trucks after Mercedes (including Freightliner in the USA) with a market share of about 15% in Europe and 12% in the USA.

Table R.9. VTC geographic distribution of sales since 1960

	1960	1970	1980	1994
Nordic (%)	69	50	25	6
Europe (%)	14	31	50	35
North America (%)	1	0	4	39
Other (%)	16	19	21	20
Units	10,600	15,700	28,100	68,500

Source: VTC.
Note: Europe excludes Nordic countries.

From being largely dependent upon Nordic markets in 1960, VTC saw significant growth in other European markets through 1970 and 1980, and a very large growth in sales in North America by 1994. In the future, VTC expects sales growth to come from other countries within and outside the OECD.

R.3.2. New models for the whole European market

In the case of VCC it is clear that the market in North America is still seen as critical, and to this extent new model designs will be developed with this market in mind as much as the domestic market in Sweden or the wider market in the European Union. In the realm of safety equipment, for example, all VCC models are fitted with high-level rear brake lights as required on the market in North America. Thus, VCC engineers its new models to meet the highest safety and other standards in the world, and then manufactures and sells all its cars on this basis – even into markets which have lesser requirements. The only exceptions are those markets which do not have unleaded petrol, where VCC has had to engineer special variants of its engines.

The Volvo 800 series has been styled and marketed to reach a younger buying population than hitherto have been traditional Volvo customers – the joint venture with TWR is in part a reflection of this strategy to create a sportier brand image.

Within the EU, while VCC can and does sell in all EU markets, it is essentially dependent upon three main countries for sales: Sweden, the UK and Germany. The cars are engineered to meet conditions in these countries, the historic strength of VCC in northern Europe reflects at least in part the suitability of their products for the conditions prevailing in those markets.

The major exception here is the joint product with Mitsubishi, manufactured at Nedcar. The Charisma/S4 reflects the needs of Mitsubishi to have a local source of a high volume, medium-sized car for EU markets as much as VCC's need to replace the 400 series.

In the case of VTC, the position is more complex. On the one hand, different basic regulations between the market in North America and that in the EU (on how truck length is measured) means that few EU engineered and produced trucks sell in North America and few trucks built there are sold in the EU. A similar story applies in the case of Japan. Moreover, commercial vehicles are less standardized than most cars, with a relatively high degree of customer/use specification. Model cycles in the commercial vehicle industry tend to be much longer than those in the car industry. The latest model to be introduced by Volvo, the FH range brought out in 1993/94, represents an important development for VTC in that it is explicitly a modular design – future models will be developed with the FH concept as the base. This approach should allow a better compromise to be reached between the need to obtain suitable economies of scale and standardization on the one hand, and the need to adjust product specifications to suit local conditions on the other.

R.3.3. Relative effects of recession and exchange rates

For VTC and VCC, movements in exchange rates can be significant, especially in terms of production in Sweden. The devaluation of the Krona in the early 1990s made output from Sweden cheaper in key export markets, but also increased purchasing costs from leading supplier countries such as Germany.

VTC sales are strongly influenced by the business cycle in the markets in which it operates.

VCC suffered from its reliance on the market in North America, which has a strong cyclical pattern of sales. VCC sales went from a peak of 117,000 in North America in 1986 to a low of 71,000 in 1990. Against movements of this magnitude, movements in EU markets have been almost trivial.

R.3.4. Implications of tax regimes for market access

As a specialist producer, operating in only a few segments, VCC is vulnerable to the distorting effects of local tax regimes on market demand. A full-range producer will usually have at least one model that is well-suited to a market, whatever the taxation regime.

VCC operates in the medium and large segments of the car market. It does not offer any small vehicles, or engines below 1.3 litre capacity. Thus, in markets where there is a strong fiscal disincentive against larger cars or larger engines (e.g. Italy), VCC is at a disadvantage. In contrast, in the UK where a fixed fee is paid whatever the size of vehicle, VCC has consistently sold well.

One particular problem faced by VCC with respect to the market in Italy was with its five cylinder engines, which were designed initially with 2.3 litre capacity. For the market in Italy, VCC engineered a special 2 litre version at considerable expense. In practice, VCC cannot recover the full economic cost of these special versions, so, in effect, volume sales in core markets are cross-subsidizing sales into markets with special requirements.

At a wider level, differing vehicle safety and testing regimes also matter to market access. VCC products are engineered to meet the highest available standards of safety and durability, but historically in Europe some key markets (mainly 'southern' Europe) did not require all of these features. In effect, VCC cars were over-engineered for these markets and were therefore at a cost disadvantage.

R.3.5. Pan-European marketing and block exemption

VCC, as with most other vehicle producers, has an established distribution and sales network in the EU countries. Again, this is not a recent phenomenon and cannot be attributed to the single market programme.

However, VCC took a longer term view of what the single market really meant. In particular, VCC considered that the current structure of national sales companies controlling franchised dealers within each country was not ideal or appropriate in all cases. Thus, VCC were interested in constructing marketing territories and dealership structures across national boundaries which, in a truly 'borderless' EU, would be possible.

In the case of VTC, the position is different. Generally, commercial vehicle manufacturers need to have a far closer contact with the final customers than is the case with cars, in order to ensure that the differing needs for a diversity of applications may be met. An important by-product of the single market programme is that it has facilitated the emergence of very large pan-European freight distribution companies which have very significant purchasing power. These groups will expect to deal with manufacturers directly, and the franchised dealership network is there to support the vehicles once they are in use, rather than to sell the vehicles.

R.4. Production costs and productivity

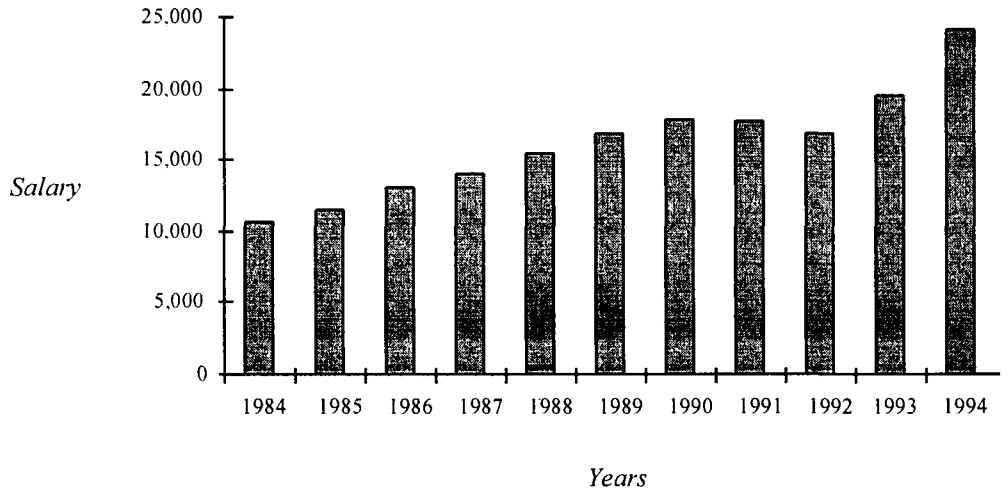
R.4.1. Changes in production costs

As with other car companies, VCC tends to re-invest in facilities alongside new model developments. So, with the introduction of the 800 series VCC completely rebuilt the Torslanda body shop and invested in capacity expansion and a new paint shop in Ghent. As these investments bring in contemporary production technologies, so production costs may improve. However, for both VCC and VTC production costs have been more of an issue with respect to labour and to capacity utilization than with production technology.

In Sweden, VTC and VCC suffered from two related problems: high social costs, and severe labour problems with respect to absenteeism and staff turnover. The tight labour market and generous social payments made it difficult for Volvo to recruit and retain staff, and it is in this context that the experiments at Kalmar and Uddevalla need to be understood. In the 1970s and early 1980s, Volvo faced absenteeism rates of 17% and labour turnover rates of 30%.

It may be that the relative switch of production to Belgium observed above could be attributed to the lower costs of production there compared with Sweden.

Figure R.3. Volvo AB total salaries, wages and other remuneration costs (including social costs) (million SEK), 1984–94



Source: Volvo AB.

R.4.2. New methods of working

In 1974 VCC opened the Kalmar plant, later to be followed by the Uddevalla plant, as an experiment in a new approach to working. Rather than the normal 1 or 2 second cycle times on the moving vehicle assembly line, VCC introduced a static assembly system in which a team of workers would assemble the entire car – with all the components brought to that one point of assembly. Cycle times were typically 45 minutes. The intention was that productivity and quality would improve through a process of job enrichment. Just as important, workers would derive more satisfaction from their jobs, have a greater commitment to the product and their team mates, and hence absenteeism and labour turnover would improve.

The eventual closure of these plants in the early 1990s came at a time when external conditions had changed (notably, the labour market was no longer so difficult for VCC as demand for cars had fallen markedly) and when VCC (along with VTC) had adopted a different approach to work organization based on the Toyota Production System. Now all Volvo plants base production on a direct customer order system in which demand pulls the flow of work through the plant. Workers are organized in teams, with just-in-time delivery of components and so forth. Levels of automation at VTC in Torslanda (a new plant) are higher than most commercial vehicle assembly plants with, for example, extensive use of AGVs to move components to the assembly points.

In 1994 VCC was unable to increase production of the 800 series at Torslanda quickly enough to meet demand. This resulted in greater customer delivery lead times and, in effect, lost revenue. As with any manufacturer, the problem is to reduce the break-even point of capacity utilization (to cope with the troughs in demand) while retaining the ability to maximize output (to cope with the peaks in demand). VCC is seeking to develop greater flexibility to achieve profitable operation over a greater range of output volumes.

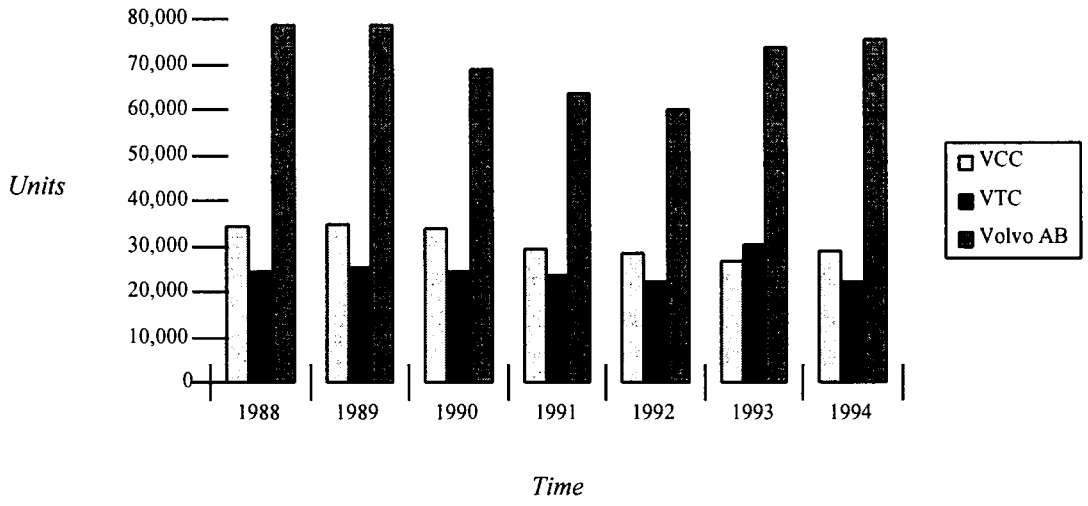
R.4.3. Effect of the single market on productivity and production organization

In the absence of hard data on changes in productivity or production costs, let alone the cause of those changes, it is perhaps unreasonable to attribute any single market effect. However, there can be little doubt that the whole issue of the EU as a market and as a source of competition has formed an important backdrop for changes in political attitudes in Sweden. VCC and VTC were thus able to convince their workforce that changes must be instituted in order for the company to survive against strengthening opposition.

R.5. Employment

R.5.1. Changes in employment levels

Figure R.4. VCC, VTC and Volvo AB employment, 1988–94



Source: Volvo AB.

Both VCC and VTC have reduced aggregate employment over the time period, a process which may be expected to continue.

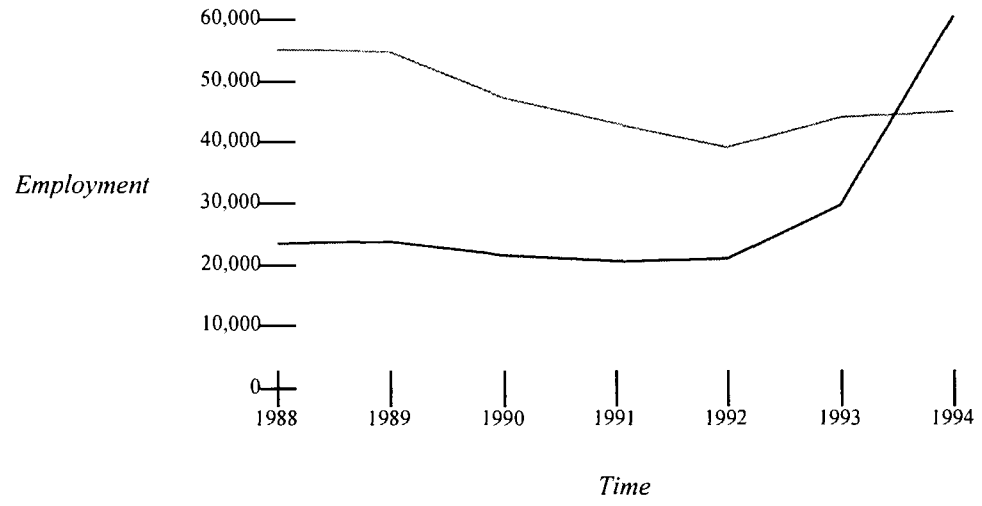
R.5.2. Changes in conditions of employment

It is not clear what level of autonomy over conditions of employment the individual plants have, or whether these issues are decided more centrally by VCC and VTC in Sweden. Clearly, conditions of employment have to be sensitive to local conditions, prevailing pay levels, etc.

R.5.3. Degree of cross-border recruitment

No data as such, but VCC and VTC are both significant employers outside the domestic HQ country, Sweden.

Figure R.5. Volvo AB employment inside and outside Sweden, 1988–93



It can be seen that while employment outside Sweden has grown in aggregate, that for inside Sweden has declined. The major employment locations for Volvo AB outside Sweden are (in 1993 figures) Belgium (6,265 staff), the United States (5,905), Brazil (3,135), the UK (2,753), and the Netherlands (1,274).

R.5.4. Effects of the single market on employment

VTC and VCC are clearly very international companies, producing and selling in a wide range of markets outside the traditional domestic HQ location. As such, the single market programme measures can only have helped the generally international outlook at Volvo. Moreover, as a specialist producer VCC has to recruit key staff outside Sweden; the industry in Sweden is simply too small to support the development of all of the specialist skills needed to develop and manufacture a car. Thus, VCC said that it recruits widely across Europe, especially for key engineering staff, and the single market programme may be expected to contribute to the effectiveness of this policy.

R.6. Manufacturing plants

R.6.1. Overview of the location and size of plants over time

Much of this has already been discussed above. For VCC the main events have been the closure of Kalmar and Uddevalla, the subsequent re-opening of the Uddevalla plant, the joint venture with Mitsubishi at Born, and the continued growth in capacity at Ghent. The stated target of VCC is to have the capacity to produce 500,000 cars by the late 1990s.

The joint venture plant with Mitsubishi at Born in the Netherlands is arguably the most important to VCC and the most interesting with respect to the wider impact of the single market programme. For both VCC and Mitsubishi, this plant can be described as one built to serve the entire EU. With Charisma/S4, Volvo shares common core components and the

internal body structure, but engines and external panels are different. Both cars, uniquely, are built on the same final assembly line. Plant capacity has been approximately doubled with the introduction of the Charisma/S4.

R.6.2. Reasons for any international relocations

As noted above, while VCC has not opened greenfield sites for car assembly in recent years, there has been some concentration of capacity and a shift in emphasis towards the existing plants in Belgium and the Netherlands. The single market programme is unlikely to have had a direct bearing on these decisions – apart from the points noted above.

VTC has similarly rationalized production in Sweden, and expanded capacity outside the domestic market – but on a more global basis than VCC.

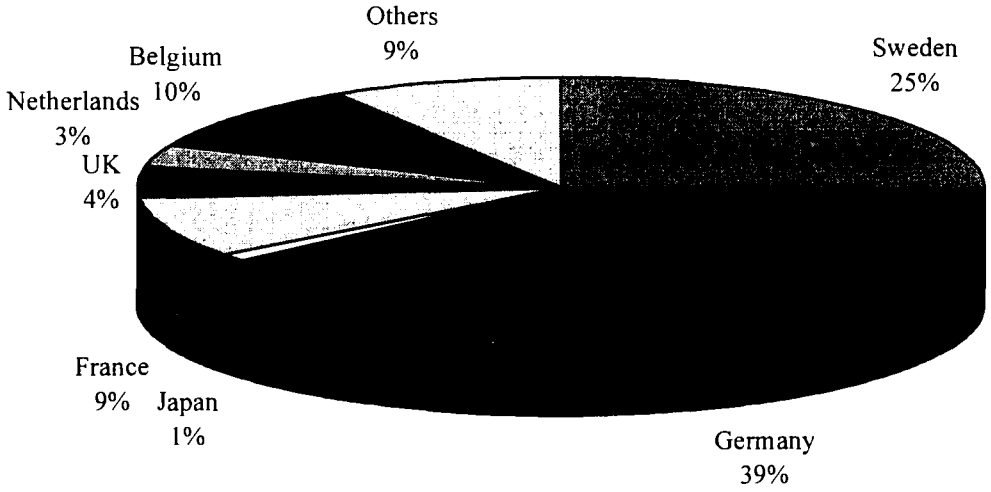
R.7. Purchasing

R.7.1. Numbers of suppliers used and their location over time

Currently about 500 main suppliers, but on a per model basis there are fewer.

VCC annual spending on components was SEK 26.2 million in 1994. Distribution of VCC spending on components by location of invoice address is shown below for 1994.

Figure R.6. Distribution of VCC component expenditure



Source: VCC.
Note: This is not the same as location of HQ of component supplier.

There are no data on numbers of suppliers, but in line with other car manufacturers VCC have been reducing the number of direct suppliers.

R.7.2. Examples of changes in cross-border sourcing

Purchasing strategy has two main elements:

(a) suppliers to be world class performing companies who actively support VCC;
(b) VCC to be regarded as the market's most attractive and professional customer.

Under this philosophy, VCC has no particular loyalty to sourcing from any location. The aim is to seek out the 'best' supplier wherever they may be located - and this has resulted in an increase in spending in Japan.

On the other hand, this philosophy is constrained by the need to secure short lead times for the delivery of components to the assembly plants. VCC defines a broad geographic area which fixes the limits of secure supply to meet lead times; beyond this area special measures need to be taken (for example, extra stocks may be held) and this makes locations outside the secure area relatively unattractive. About 60% of spending is on just-in-time or small batch deliveries, and this has reduced the extent of 'long distance' sourcing.

Germany has been the major source for at least 15 years. Since the 1980s, there has been a major decline in spending in the UK, attributed by VCC to quality problems with UK-based suppliers. VCC buys in US dollars from Japanese suppliers to take advantage of currency movements. In recent years, the volume has gone down, but currency changes mean the value has not changed. Japan is used as a source of contact for technological development in key fields and components.

One by-product of the failed merger with Renault was that VCC was introduced to a wider supply base, especially from France and Italy, which gave more opportunities to moderate their dependence on suppliers in Germany.

All quotations are based on ex-works price. Volvo then factors in the travel cost itself (common practice among vehicle assemblers) and then compares quotes on landed cost.

R.7.3. Effect of exchange rates

See Section R.7.2 for examples.

R.7.4. Views on internationalization of the supply base

VCC and VTC are relatively small volume producers, and the domestic automotive industry in Sweden is also relatively small, despite Scania and Saab also being present. As a consequence, both have long been disposed to international sourcing, with Germany as the main location for suppliers.

As a result of long-run cost escalation in components delivered from Germany, VCC and VTC have broadened the geographical scope of sourcing.

R.7.5. Effect of the single market

The single market programme has acted as an important enabler in these processes – it is particularly relevant to the concept of a defined geographic area for secure lead times for example. In so far as the single market has improved the security of delivery schedules, it has

made it possible for VTC and VCC to access a wider potential supplier pool from which to choose its preferred suppliers.

R.8 Research, design and development

R.8.1. Estimation of cost savings from the component type approval process

It should be noted that VCC considered the component type approval measures to have had a small, marginal net benefit in terms of cost savings, but these have been outweighed by large cost savings arising from the introduction of new purchasing approaches.

R.8.2. Estimation of cost savings from the whole vehicle type approval measure

VCC considered that the effect of whole vehicle type approval in terms of absolute cost savings was relatively small, though in terms of 'time to market' a more important benefit could accrue. RD&D costs were influenced by the costs of engineering variants to meet specific national market requirements, but these were based on fiscal or other issues rather than those addressed by the whole vehicle type approval process. In the most extreme case, that of engineering a car to right hand drive, the changes required affected 15% of the total car by value.

R.8.3. Key changes in research, design and development

In the case of VTC, as noted above, the most recent model introduction (the FH series) has a modular design philosophy which should allow future models to be derived more quickly and at lower cost. This philosophy of 'design for flexibility' has also become established at VCC – where the impact is most noticeable in production equipment. A typical investment which illustrates this point is the VCC body framing line at Torslanda. This equipment can be reprogrammed to produce a wide range of cars, and is used by VCC instead of the more traditional fixed equipment. The programmable body framing line has a higher initial investment cost, but traditional fixtures had to be scrapped for new model introductions. So the programmable line should have lower costs over several model generations. As with VTC, VCC has sought modularity in its recent family of engine designs.

VCC RD&D spending peaked in 1990 at about SEK 4.8 million with the introduction of the 800 series. By 1993 this had fallen to SEK 2.4 million. Similarly VTC RD&D spending peaked in 1992 with SEK 2.5 million. In both cases the costs of staying in the automotive industry are high. While VTC has sought modularity of design for its own products, and added value through the acquisition of bus building companies, VCC has sought RD&D savings through its joint venture with Mitsubishi – and may in the future produce a version of a Mitsubishi 4x4 vehicle. At the time of the alliance with Renault, there was some discussion of a Volvo version of the Espace or its replacement – this appears to have lapsed with the alliance.

As with other manufacturers, VCC and VTC now make extensive use of the capabilities of suppliers in terms of RD&D.

However, it is not clear whether VCC can meet the costs of developing further new vehicles. Volvo AB has divested itself of most of its other assets outside the automotive sector, a process which provided extra revenue to fund new models and production investments.

Returns on sales do not appear to be large enough to generate sufficient revenue to cover RD&D costs.

R.8.4. Effects of the single market

The single market programme has probably offered a marginal direct reduction in RD&D costs, but this effect is negligible given the very large sums which VCC and VTC must spend. That is, VCC and VTC need to reduce RD&D spending by an order of magnitude more than the savings offered by the single market.

R.9. Business strategy

R.9.1. Key alliances developed

As of 31 December 1994 Volvo AB had shares in the following non-group companies:

Table R.10. Shares in non-group companies

Company	Location	Volvo AB holding (%)
VME Group NV	Netherlands	50
Netherlands Car NV	Netherlands	33
Xian Silver Bus Corp.	China	50
Renault SA	France	11

Source: Volvo.

There are also shareholdings in smaller companies in, for example, Botswana.

The Renault-Volvo merger involved a set of cross-shareholdings and payments linking both the car and the truck divisions of both groups. By 1994, the process of disentangling these cross-shareholdings was well advanced but not completed.

The most important alliance is with Mitsubishi in the Born plant in the Netherlands. Mitsubishi hold 33%, while the remaining 33% is held by the government.

Since 1994 Volvo has acquired the remaining shares of VME Group NV at a cost of SEK 4.2 billion.

In May 1995 VTC announced it had agreed to purchase Provost Car Inc. (Canada) for SEK 740 million. Half is then intended to be sold on to Plaxton (UK) to create a joint venture bus body producer for the North American market.

In January 1995 VCC and TWR (UK) formed a joint venture to produce low volume cars at the Uddevalla plant. VCC has a 49% share, TWR a 51% share. Volvo will invest SEK 1.5 billion, including product development.

The failure of the alliance-merger with Renault has not necessarily refuted the industrial logic behind the desire to merge. It remains to be seen whether there is indeed a necessity to create ever-larger European automotive groups, or whether specialist producers such as Volvo can continue to survive in the competitive marketplace.

R.9.2. Changes in business process strategy

Purchasing

As with other manufacturers, VCC and VTC have introduced widespread changes in how they purchase components and materials. In brief, this entails:

selection on cost, quality and delivery;
just-in-time supply;
supplier performance measurement;
reduced numbers of direct suppliers;
robust EDI systems;
co-development of new products with suppliers;
continuous improvement.

It also entails being a good customer – for example, by having robust and stable production schedules.

On a per annum basis VCC is reducing its supply chain with perhaps 25 suppliers removed, but also five new suppliers added. VCC have identified 160 product areas, and the intention is to have one supplier per component area per model or platform.

With co-development with suppliers, VCC expects to save 30–40% in RD&D costs.

Manufacturing

As noted above, VCC and VTC see flexibility in manufacturing as the key to their competitive survival. For VCC, which has relatively low production volumes on a per model or a per plant basis, this flexibility is necessary to compete with the low cost, high volume producers.

At a strategic level, VCC involvement with Mitsubishi may offer important learning advantages in terms of the transfer of production technologies and work organization. The Born plant has the potential capacity of 412,000 cars per annum, large enough to capture full plant-level economies of scale.

Sales and distribution

VCC and VTC operate a customer-order based sales and distribution system by which surges in demand are managed by increasing customer order delivery times. Sales and distribution are organized on a national basis within the EU, though this may change in the future.

VCC has sought to differentiate itself in the past through the quality of its service and repair work in the distribution network – and to some extent this strategy has been successful. As a specialist producer, VCC is unable to maintain the extensive and exclusive networks of the

volume producers in all markets. Having a car which sells in reasonable volumes is therefore important to provide the franchised dealerships with a steady and reliable income.

VTC distribution networks have been more stable than those of VCC, as well as considerably smaller in number. VCC and VTC own a proportion of their dealerships, but this is not expected to increase in the near future.

VTC expects the long-term trend of sales growth in markets outside Europe and North America to continue. Whether VCC can sustain a strong presence in emerging markets is less clear. VCC has a small assembly plant in Thailand and has generally expanded sales in the Asia-Pacific region.

RD&D

As noted above, VTC and VCC have considerable pressure on RD&D budgets. The main thrust of strategy is thus to reduce RD&D spending on both product and process development wherever possible.

VCC and VTC also have a strong commitment to the social and environmental aspects of their products, and thus environmental issues play an important part in their RD&D.

Illustrative of this are the series of concept vehicles shown by VCC and VTC:

(a) the Environmental Concept Car;
(b) the Environmental Concept Truck;
(c) the Environmental Concept Bus.

VCC has been active in researching hybrid powertrain systems, and has shown gas turbine/electric versions in concept vehicles.

R.10. Views on future EU actions to help the sector

No particular views were expressed. To a certain extent VCC and VTC are still learning about the way in which the European Union works. Volvo AB has established a corporate office in Brussels to represent the company and to keep VCC and VTC informed of any developments in EU policy or legislation which could have a bearing on operations.

The most important single change would be in terms of a single European currency. This was seen as a significant step to a more fully integrated market. As important were Volvo AB views on the operation of EU regional and industrial policy. Volvo AB questioned the wisdom of subsidizing capacity expansion in regions with no historic interest in automotive production. Instead, regional and industrial funding resources should be used to focus on the distinctive character and specialisms of the regions.

R.11. Annex

R.11.1 List of persons interviewed

Djell Drotz (VTC), Manager, Competitor and Industry Research
Lars Angervall (VTC), Manager, Industrial Development
Anders Johannesson (VTC), Product Planning Department

Christine Ericsson (VTC), Public Relations
Tom O'Donnell (VCC), Director of Strategic Planning
Lutz Hanicke (VCC), Project Manager, Vehicle Concepts
Lars Bolminger (VCC), Director, Strategic Sourcing and Partnership
Rolf Wadell (VCC), European Affairs
Sten-Olof Gustavsson (VCC), Team leader, ABC Project
Lars-Erik Larsson (Volvo AB), Manager, Technological Development
Roland N.-G. Gustafsson (Volvo AB), Director, Industrial Development

R.11.2.Articles/other information used

EIU (1995), A strategic update on Volvo, European Motor Business, 3rd Quarter, 1995.
Volvo AB (1994), Annual Report.
Volvo AB (1995), Financial and Operating Statistics 1994/95.
VCC (1994), Fact Sheet, March 1994.
VTC (1995), Business Seminar 1995.

Additional information was provided in the interviews.

APPENDIX S

Case study on Fiat

S.1. Introduction

This case study aims to analyse the impact of the implementation of the single market programme on the Fiat Group.

More specifically, this study is centred upon car production activities by Fiat Auto and industrial vehicles production by Fiat Iveco. The period described starts from the second half of the 1980s.

In 1989, Fiat's top management made the decision to embark upon a radical restructuring plan. The plan, which was first targeted at overall product quality (Total Quality plan), was then refocused and upgraded to include projects and actions to foster a thorough change of strategies and an overall restructuring of the company. We shall try to describe the main objectives and results of these actions when dealing specifically with Fiat's recent strategies.

The case study is based on various documents, meetings with experts, and personal interviews with executives from the departments of Fiat which were deemed to have been more affected by the implementation of the single market. The interviews were carried out to collect personal opinions from these individuals on the validity of our research hypotheses. Wherever possible, we tried to obtain a quantitative assessment of the effects of the single market on costs. However, in most cases we were able to obtain only qualitative answers.

S.2. Company background

Set up in 1899, Fiat grew rapidly in the 1950s and 1960s when mass motorization spread throughout Italy. In the 1970s, Fiat, continuing in a long established tradition of diversification, embarked upon a major reorganization. Non-auto sectors were spun off and set up as independent companies. In 1979, auto manufacturing was established as an autonomous unit under the name of Fiat Auto, while Fiat became the holding company.

The Fiat Group is highly diversified. However, car manufacturing is still the core business: in 1995, the auto sector accounted for 48% of employment (out of a total of 236,800) and for 51% of turnover (LIT 75,500 billion), whereas commercial vehicles represented about 15% of employment and turnover. The importance of the car sector has remained stable over the years while commercial vehicles have declined slightly. Agricultural machinery and construction equipment (New Holland) represent 8% of employees and 11% of turnover. The Group maintains units in the field of auto components with Magneti Marelli (10% of employment and 8% of manufacturing) and Teksid (foundries, 5% and 3% respectively).

Fiat Auto is present in 30 countries through 71 companies (1994): it has plants in Italy (25), Poland (6), Brazil (1), Venezuela (1) and Argentina (1). Other production sites are joint ventures with the Peugeot Group (1 in France and 1 in Italy) and through many overseas licensees (among which Turkey is the most important). With the acquisition of Alfa Romeo in 1987, Fiat became the sole Italian car manufacturer (excluding niche market manufacturers).

The Iveco industrial vehicle holding was set up in 1975 as a joint venture between Fiat (80%) (which already had units in Italy and France) and the German manufacturer Kloeckner-

Humboldt-Deutz AG (KHD) (20%) which merged their truck and bus manufacturing activities. Five years later KHD's share was bought by Fiat. The joint venture, initially a very 'Italian' concern, has become a real multinational company through various acquisitions and initiatives. In 1982, in co-operation with the Swiss company of Saurer, Dereco was set up. This was a company operating in the field of fluid dynamics and injection; it was later bought by Iveco. In 1986, there was an agreement between Iveco and Ford to establish Iveco Ford Trucks in the UK (managed by Iveco). In 1990, Iveco acquired 60% of Enasa of Spain and its branch Seddon Atkinson (UK). In 1992, it also acquired International Trucks of Australia.

S.2.1. Nature of products

Since its inception, Fiat has concentrated on its home market and specializes in the economy car segment.

However, the acquisition of Alfa Romeo strengthened its presence in the luxury car segment. Currently, Fiat sells its products under six different makes: Fiat, Lancia, Alfa Romeo, Innocenti, Ferrari, and Maserati.

Iveco produces the full range of commercial vehicles, but specializes in light and medium vehicles.

S.2.2. Geographic markets

Despite its traditional entrenchment in the home market, Fiat is pushing hard to expand its share of non-European markets.

The strong foothold in Italy has declined from a market share of about 60% in 1985 (including Alfa Romeo) to 46% in 1995. The Italian market still accounts for 59% of total sales of 1,331,800 units in Europe in 1995. Germany comes second with 9.9%, France third with 9.3%, then the UK (5%) and Spain (4%). Fiat maintains a significant manufacturing presence in Poland (Fiat Auto Poland) and in Brazil (Fiat Autòmoveis). Currently Fiat has 51.2% of the Polish market, i.e. 135,600 cars in 1995. In 1995, Fiat's production in Poland reached 279,000 units, of which 205,000 were the 'Cinquecento'. This model is exported throughout Western Europe with a market share in its segment of 56%. In Eastern Europe, Fiat's share is 6.3% in Hungary and 3.9% in former Czechoslovakia.

In Brazil, Fiat Autòmoveis holds 28.3% of the market, i.e. 389,000 vehicles out of its total production of 434,000 cars in 1995. In Argentina, with 79,000 cars sold, it has carved out a share of 28%. Fiat is also engaged in various joint ventures or licensing agreements: the most important is Tofas in Turkey, where it has 58.6% of the market (116,000 cars in 1995).

In 1994, Fiat sales of cars were broken down as follows: 38% in Italy, 23% in the rest of Europe and 39% in the rest of the world.

Turning to commercial vehicles, Iveco is less dependent on the home market than Fiat.

The Italian market share (vehicles >=3.5 tonnes GVW) is quite high, though it fell from 68.7% in 1985 to 52.1% in 1995. Commercial vehicles are also manufactured by Fiat Auto (under the Fiat brand name), which alone held 34% of this specific market in Italy in 1994 (Fiat and Iveco together reached 50% in the light vehicle segment).

Sales of Iveco vehicles in 1995 were as follows: over 34% in Italy (with a market share of 52.1%), 16.3% in France (market share 17.3%), 16.5% in the UK and Ireland together (14.3%), 16.5% in Germany, Austria and Switzerland (11.6%), while Spain and Portugal account for 10% together (but with a 20.3% market share). The remainder is sold overseas through licensing agreements, mainly in Turkey and India.

S.2.3. Number and location of plants

In Europe, Fiat's production base is totally concentrated in Italy. However, the number of cars assembled in pan-European plants is steadily increasing.

Fiat's car production in Italy is distributed in 25 plants. Manufacture of parts (Teksid and Magneti Marelli) is distributed more evenly and some plants are located outside Italy in Europe. Furthermore, the Polish and Brazilian plants have attracted plants from parts manufacturers (which are Fiat's partners).

Iveco's manufacturing plants are less concentrated in Italy, although its extra-European presence is less marked than that of its main competitors. In Europe it has 21 plants out of a total of 25. Total production was 98,200 vehicles and 247,800 engines in 1994, almost entirely manufactured in Europe. A further 36,000 vehicles were produced by Iveco licensees around the world.

Production of light and midsize trucks and buses is concentrated in Italy (over 16,000 employees in 1994) and Spain for the light trucks (3,700); France specializes in engine production (2,000 employees). Heavy trucks and vehicles are manufactured in Germany and Spain (with almost 5,000 employees), midsize trucks are made in the UK (with 900 employees). Iveco also operates overseas in many non-European countries through wholly-owned subsidiaries: in Australia (with 600 employees), Venezuela (150); Ethiopia (180); and South Africa (30). Minority stakes are also held in various ventures in Turkey and India in addition to a 50:50 joint venture in China as well as licensing agreements in Libya, Tunisia, Egypt, South Korea and Argentina.

S.2.4. Trends in production

Car production by Fiat Auto, after a drop in the early 1990s, has levelled off in 1994, when it recovered from its previous slump, at about 2,107,800 units. This was about 6% less than the record year of 1989.

A further 247,600 cars were produced by partners and licensees (1994).

The geographic distribution of production has changed over the last few years: Brazil has contributed with 455,000 units in 1994 and the acquisition of the Polish plant has added a further 239,000. As a result of this, production which used to be 90% in Italy in 1990, dropped to 67% in 1994. If manufacturing by licensees is taken into account, Italy's proportion falls from 72% in 1990 to 60% in 1994.

S.3. Effects of the single market on market access

S.3.1. How sales outside the national market have changed over time and the reason for this

The poor competitive performance of Fiat in Europe since 1990 was mainly due to unsatisfactory product characteristics and an inefficient distribution system. The situation has dramatically improved since 1994, which represents a turning point in its position as an international player.

In the 1980s, Fiat's strategy focused on the home market which at the time was showing high volumes of growth and over 60% of cars shipped in Europe were sold in Italy. Following the acquisition of Alfa Romeo in 1986, the market share in Italy reached 57% and Fiat became a market leader in Europe with a 15% share (primarily through the exploitation of the Uno). In the second half of the 1980s, Fiat managed to increase its market share in France, Germany, and the UK, but lost ground in Belgium and the Netherlands. From 1990 onwards, Fiat started feeling the pinch of the competition. It lost market share and only began to recover in 1994. This trend was first felt in the home market, beginning in 1990, but then, from 1991 was also seen in the other European markets.

The dull product range and a flawed marketing strategy have been pointed out as the reasons for the company's slide. Fiat traditionally styled itself as a volume maker concentrating in the low segment of the market, but small, economical models no longer appeal to the European consumer and their market share is therefore small. On the other hand, the company's performance in the mid-size car segment (C), which is the most popular in Europe, did not match that of its competitors. The Fiat Tipo and Alfa 155 failed to win the volumes that had been expected of them. Eventually, in the B segment, Fiat was competing with a model, the Uno, which had lost its appeal and was about to be phased out.

Particularly in Italy, in a seller's market situation, the marketing strategy endorsed by Fiat was heavily price-oriented, favouring discounts instead of servicing. In Italy, the number of franchised sellers had been increased, whereas in the rest of Europe the sales network was regarded as insufficient.

In 1993, Fiat started launching revamped or totally new models at a fast pace and in three years renewed the entire range of products. The renovation began with the basic model, the Punto in the B segment, which boosted Fiat's share in the segment in Europe from 14.7% in 1993 to 19.5% in 1994. The A segment was easily won with a 82% share in 1995 with the Cinquecento model. Also, the mid-size range was targeted with the new Bravo and Brava models from October 1995. The range has been widened to include niche models such as the Barchetta, the Coupé, the Ulisse, the Lancia Y, the Spyder Alfa Romeo, and others.

A major overhaul of the distribution system has reduced the number of franchised distributors and a more systematic evaluation system to monitor their performance has been developed. Furthermore, Fiat has developed a new logistics system and a series of initiatives (such as payment, contractual and guarantee terms) which enhance the services provided to customers.

As to industrial vehicles, Iveco's market share in Europe since the end of the 1980s levelled off at 20%, while the share in Italy declined significantly from 68.7% in 1987 to 56.4% in 1994. However, 1994 signalled a slight rebound in Italy.

S.3.2. Launch of new models for the whole European market and the reasons behind this

Between 1993 and 1996 Fiat has totally renewed its product range. The sales strategy has been refocused and Europe is now viewed as the domestic market.

An extraordinary investment effort was devoted to this goal, totalling LIT 40,000 billion between 1993 and 1996.

The new model range is focused on the mid-size segment, which is the most important in Europe as well as the most stable in terms of volumes of sale. The models upon which Fiat's strategy for the segment hinges are Bravo and Brava which are two different cars based on a similar project. The 18 new models include cars designed to fill niche markets (spyder, coupé, family vans), which are able to generate adequate returns and support brand recognition.

In the industrial vehicle sector, the new 'Euro' model range (1990s) testified that Iveco had achieved a pan-European standing.

S.3.3. Relative effects of recession and exchange rates on the level of access to other European markets

Recession and the weaker lira have had little impact on Fiat's market share position in Europe. The market share rebound was achieved with new models, quality improvement and the global restructuring in the Italian car 'filière'.

The slump in the European car market happened when Fiat was in the middle of its plans to turn out new and more competitive products and when its manufacturing restructuring required huge investments. The weaker lira has had only a limited effect. However, the devaluation has been primarily used to restore profitability rather than sell more cars in a market already hit by a recession. It has also been used to offer models with a better choice of options. This is confirmed by the analysis of prices in the various European markets (although comparison is made difficult by the different equipment offered by the same models in different markets, and their changes through time).

Room for price adjustments in the various European countries is limited. The weak lira has penalized foreign makes in the Italian market where, to keep prices aligned to the market, exporters have had to shave their margins (in hard currencies) significantly, whereas Fiat managed to make bigger profits (in lira).

As already stated, market share has not been modified and Fiat's position did not change significantly until the introduction of the new models.

Many obstacles stand in the way of a realignment of prices following a currency devaluation.

There is the necessity to defend the brand's image from excessive discounts and too aggressive pricing.

The price lever by itself is not sufficient to lure new customers who also look at the quality and novelty of the product (at the time, Fiat was not offering competitive products). It is possible to use price only with finely targeted promotions.

The weaker lira has had little effect on industrial vehicles, which are characterized by a more integrated European network of manufacturing units. Margins were unaffected since advantages on parts made in Italy were offset by increases in production costs elsewhere: the geographic diversification insulated prices and costs from currency realignments. Market shares were unaffected by the devaluation. However, in some European markets Iveco was able to make a few gains in 1993: light trucks, manufactured in Italy, could have taken advantage of the initial sharp drop in the value of the lira.

S.3.4. Implications of different tax regimes for market access

Existing differences in the taxation of the car, peculiarities in the administrative regimes, and some policies designed to protect local markets are restricting a truly unified market.

Some interviews stressed how the implementation of an open, unified market has been under way for a long time. Proof of that is the shrinking domestic market share in Italy. This was 70% in the 1970s and is now around 50%. A true open market is an ongoing process and the measures taken since the 1985 White Paper do not appear to have had a great impact on a company already engaged in a highly competitive European market.

Europe has been considered an 'open' market for a long time. On the other hand, if one assumes the market as a set of rules (i.e. not 'open', but one single market), the case is different and the objective is far from established. The incomplete fiscal harmonization is the main obstacle to a fully integrated market. The VAT and excise regimes are mainly to be blamed: for them only a minimum threshold has been established and this allows ample room for different fiscal regimes. Ownership or usage taxes are levied according to alternative parameters (sometimes the various fuels are considered, sometimes the engine size, etc.). The differences in the fiscal systems tend to generate a different segmentation of the national markets. The fiscal lever is still used as an instrument of discrimination against some foreign competitors.

A blatant case of difficulties arising from the incomplete fiscal harmonization is the fiscal treatment of diesel powered cars in Italy. The rules have been reversed so often and inconsistently to lure Italian producers away from a lucrative European market by depriving them of a home market. Fiscal differences are relevant to establishing the street price of a car, hence the wide differences in prices in the European countries and their implications for national strategies of manufacturers.

A significant factor affecting accessibility and performance of the different markets are the incentives for the disposal of the very old vehicle population: these can alter the accessibility to the various markets independently of prices (e.g. measures adopted in France by the Balladur and Juppé Governments).

The used car market is also very important: its size is twice that of the new car market and car makers' activities are influenced by it. Total harmonization in this field is far from achieved: cars are considered differently from an administrative point of view in the different European markets. In some countries cars almost new are considered used. This way they feed a parallel market.

In Italy, sales of used cars are subject to VAT only in case of purchase by a company, whereas individuals are exempt. Furthermore, sales of second-hand cars are authorized on certain conditions which vary according to the state: in some countries the prospective dealer is

required to join a professional association.

In the case of vehicles, public procurement is seldom open to non-national manufacturers. In Italy, for instance, there are limited examples of foreign cars used by the police or the Carabinieri (Toyota, Range Rover). In the case of public procurement, it is easy to make it impossible for a foreign bidder by asking for specific technical requirements which are the standard specification of the national producer. In addition, the protection against unfair practices in public procurement operations shows sharp differences in Europe. In many European countries other than Italy, when an appeal is filed by one of the bidders, the contract is not suspended. The public administration goes on with the purchase and compensation is granted only afterwards. On the contrary, foreign car makers in Italy are advantaged because Italian law provides for immediate suspension of the bidding procedure even in the case of minor irregularities. Some European administrations require standards which are still debated by the EU (for example, the Netherlands, Germany, and the UK ask for ISO 9002). There is also a question of reciprocal recognition by the national standards bureaus.

S.3.5. Introduction of pan-European marketing and distribution networks and the effect of the block exemption

Fiat's reorganization in the course of the 1990s has resulted in changes to the organization, the logistics, and advertising/promotion. These transformations were implemented with the customer's satisfaction in mind.

Since the mid-1980s, Fiat's redesigned sales strategy has cut the number of authorized exclusive dealers and set up a Europe-wide sales network which should uniformly service the area. The sales network is made up predominantly of independent authorized dealers, who are co-ordinated by a central unit; a few Fiat-owned outlets account for a small proportion of total sales. Also, sales managed by local import companies were eliminated (with the notable exception of Austria). Contracts with European dealers have declined from 4,821 in 1992 to 4,202 in 1995. Cuts were deepest in Italy, but also in other European countries with the exception of Greece, Portugal, and France. These numbers hide sharper reductions in the number of dealers, because some were awarded more than one contract for different Fiat Group makes at the same time (two-contract policy). This policy aims at strengthening the dealer's managerial and financial skills and its autonomy by increasing its size.

Particular care has been applied to logistics. An information network (SIRIO) connecting the market (sales network, customers) with production (plants and suppliers) has been set up. In the old systems, the company manufactured and distributed through its dealers' warehouses (with high costs due to stocks sitting in the yards of both Fiat and its dealers). In the new system, production is closely coupled to orders coming via the dealers with ample choice for the customers. The authorized dealer used to contact Fiat to transmit the order once a month, while, currently, the lag has been cut to once a week. Within the same week, the dealer is able to tell the client when the car will be ready.

This system allows for:

(a) acceptance of all orders;
(b) keeping the customer posted about the various production steps;
(c) modification of some specification of an order already being processed by the manufacturer.

A system named FOCUS has been implemented to make a virtual stock accessible to all dealers made up of all the cars already ordered, but not yet produced, i.e. the full production programme. Each dealer can browse through it to pick a car meeting its requirements and not yet assigned a client. This system optimizes the flow of orders, easing the exchange of 1 million ordered (but not yet produced) cars among dealers which may be very distant from one another at no added cost for re-shipment.

The restructuring of the entire distribution network has dramatically reduced the time elapsed from acquisition of the order to its processing by the suppliers' manufacturing programmes (from 45 to 14 days).

Advertising appears to be very much uniform throughout Europe. The so-called 'institutional' advertising (designed to promote the image of the make or its models) is run by Fiat's headquarters, but targets the European customer. Advertising for specific promotional campaigns is run at a local level, particularly since promotions do not usually extend over borders. The advertising budget is accounted to agencies located in Italy with branches in Europe which manage the local adaptations, such as language.

The block exemption was unanimously considered by Fiat to have favoured dealers at the expense of producers and consumers. The new agreement allows multifranchising, although with limitations (different makes must be housed in separate showrooms and managed by different companies). The possibility of common servicing makes it hard to assess costs with reference to each individual make.

Another point subject to criticism is the liberalization of the radio and television advertising which, by allowing promotion beyond the contractual area, can give rise to conflicts within the commercial network. (Moreover, it is still unclear if the use of posters beyond the contractual area is allowed.)

The sales strategy of the commercial vehicles industry has been severely affected by transport liberalization. The deregulation in the transport service and the elimination of customs controls favoured concentration in the sector. The bargaining position of the truck manufacturers is dwindling with respect to bigger and more competitive customers. On the other hand, direct sales through Iveco's branch offices are growing.

S.4. Manufacturing plants

S.4.1. Overview of the location and size of plants over time

With the exception of the internationalization initiatives on an extra-European basis, Fiat Auto has historically concentrated its activities in Italy. In the last decade, a number of changes have occurred in the location of production sites.

Production has shifted from northern Italy to southern Italy. This was in part a response to policies aimed at developing such areas. In particular, in the new southern plants, the employment trend has been more favourable (or less unfavourable) in the last few

years, compared with the other manufacturing sites.

In 1987, Fiat took over Alfa Romeo and acquired its two plants at Arese (Milano) and Pomigliano d'Arco (Napoli).

The Desio (Milano) and Chivasso (Torino) plants were closed in 1991 and in 1992 respectively, while Arese (Milano) was partially reconverted.

In 1994, the Sevel Campania plant (commercial vehicles, with about 1,000 employees) ceased production as a consequence of a rationalization by allocating production to another plant in the area (Sevel at Atessa).

In 1994, the new plants of Melfi (Potenza) and Pratola Serra (Avellino), located in southern Italy, came into operation, and represent the hub of Fiat's production.

Fiat targeted for closure not only small plants but also those where the production facilities and organization were older.

It is worth noting that the new plants have considerable productive capacity (Melfi can assemble 450,000 cars a year).

S.4.2. Reasons behind international relocations

Fiat has not carried out any international relocations within Europe in recent years, while additional productive capacity has been expanded in emerging economies outside Western Europe.

In the recent decisions to set up new plants Fiat favoured Italy. Owing to the characteristics of the new plants (greenfield investment), other locations in Europe with similar features as to cost and manpower availability were eligible. The logistical considerations (a better integration with other Fiat operations) as well as a propensity towards Italian locations have played a decisive role in choosing Italy. The investment grants which were obtained could have been secured in other countries, too.

With the exception of the various international ventures involving licensing agreements, which concern several countries in different regions of the world, Fiat carried out two important investments abroad. In October 1992, Fiat bought 90% of FSM in Poland (the remaining 10% was held by the Polish Ministry of Labour). This followed a long relationship with the firm consisting of many licensing agreements for the production of several Fiat models and, finally, the 'Cinquecento'. At present, Fiat Auto Poland has a 50% Polish market share and provides the whole 'Cinquecento' Fiat production, and it has recently started producing the 'Uno' (which was recently phased out in Italy). The Polish investment brought with it a considerable flow of component and equipment exports to the country, which were supplied by Fiat Group's companies, in addition to some direct components operations which were set up in the country. The reasons for the Polish investment were to take advantage of the development of Central and Eastern European markets as well as the opportunity to export to western countries from a lower cost production basis.

In Brazil, Fiat Automòveis was jointly incorporated by Fiat and Minas Gerais State in 1973, but, in 1987, the Brazilian partner was bought out by Fiat. In 1995, it reached a 28.3% share of the Brazilian market and was an important exporter. 'Uno' is the most important model. In this case also, the main reason for Fiat investment is the market perspectives of Brazilian and

Latin-American markets, particularly after the start of Mercosur. Some models are also imported to the European market from Brazil.

First Brazil (from April 1996) and then Poland will be the hub of the 'Palio' production, the Fiat 'world car' for emerging markets, whose production will be extended to Brazil, Argentina, Venezuela, Mexico, Morocco and South Africa. As a consequence of the launch of the 'Palio', the distribution of Fiat's sales will be 1/3 in Italy, 1/3 in Europe and 1/3 in the rest of the world.

A licensing agreement was signed in 1995 in India for the production of the 'Uno'; in China Fiat presented a proposal to the government authorities to produce a family car locally.

Iveco's strategy is also targeted to further internationalization, taking into account that the company has the strongest European productive roots among the other big European producers.

Iveco has recently taken over the International Trucks of Australia (1992). It has also signed an engine and gear production agreement with Motor-Sich as well as a light vehicle production agreement with Kraz, in Ukraine. It has also developed a 50-50 joint venture with Najing Auto Work in China to produce 60,000 light industrial vehicles a year.

The reasons for such internationalization strategies are:

(a) the opportunity to exploit economies of scale both at production and at design levels;
(b) the exploitation of the technical and technological capabilities in high potential growth markets;
(c) more stable business operations through compensation of the different cyclical behaviours in the various regions.

S.5. Production costs and productivity

S.5.1. New methods of working

The reorganization carried out by Fiat since the early 1990s is based, from the productive point of view, on the Fabbrica Integrata (Integrated Factory) project, which adopts the Toyota framework, adapting it to the specific reality of Fiat. It also takes into account the shortcomings experienced in the previous organizational innovations and the rigidities embodied in certain kinds of automation.

Less importance is attributed to automation and greater attention is paid to integration with human work to obtain a more flexible production process and an easier control over the production variances. These organizational changes try to overcome the shortcomings (rigidities) of the high process automation experience in the 1980s at the Cassino (assembly) and Termoli (engines) plants. These innovations have found the widest application in the new plants (1994) of Melfi and Pratola Serra, though they have been extended to all of the Group plants.

There is a shift away from a functional organization towards a process-like organization through the integration of various phases and skills. Fiat's aim is to obtain the prevention, variances absorption, self-control and continuous improvement integration at a basic level and

to reach the objectives of quality, productivity and service. This requires a collaborative approach with the workers, a relevant adaptation capability and a significant functional integration. This is achieved through a reduction of hierarchical levels. In general, the control is decentralized and brought closer to production. These innovations imply a change in the qualifications and attitudes required of the workers, and, consequently, different recruitment, training and remuneration systems.

S.5.2. Changes in production costs and productivity

The productivity gains and the cost reductions achieved through the implementation of 'lean production' strategies within the 'Fabbrica Integrata' are significant.

These improvements can be illustrated by comparing the performances of the new Melfi (assembly) and Pratola Serra (engines) plants with the older ones: Cassino and Termoli. In the new plants there has been a reduction in the time based manufacturing, measured by the time required by the car to go from the start to the end of the line. This indicator is lower at Melfi compared with Cassino, by 40% in body welding, by 30% in paint and 8% in final assembly. The total time devoted to these operations is 27 hours at Melfi and 38 hours at Cassino. In addition, the number of parts stored along the lines has decreased by 32%.

There are also large savings in terms of the number of cars produced by investment unit: the capital turnover index is estimated to be 35% higher in body welding and 115% in final assembly. At Melfi 79 cars per worker will be produced, while at Mirafiori's (where segment B cars are also manufactured) only 53 (calculations are made on the basis of IMVP standard methodology). Similar performances will be achieved at Pratola Serra (time based manufacturing decreases to 18 hours from 25 hours for the older Termoli plant).

S.5.3. Effect of the single market on productivity and production costs

The performances in terms of productivity are the effects of the growing global competition in the sector, which could have been caused only indirectly by the single market programme.

However, some measures undertaken, in particular those relating to the environment, have generated a considerable increase in costs. The command-control orientation of the set of environmental rules implies a cost-efficiency ratio higher than would be achievable with the adoption of a 'voluntary regulation'.

S.6. Purchasing

S.6.1. Numbers of suppliers used and their location over time (and intra-firm sourcing)

The main changes occurring in this area are a reduction in the number of suppliers, an increased empowerment in the product concept and design, a partnership-like interaction, with the implementation of 'assisted growth' ('crescita guidata') and the diffusion of just-in-time supply. The component makers owned by Fiat have become more international. The captive buying by Fiat is still an important supply strategy.

Fiat is traditionally highly integrated. This is as a result of the insufficient development of the industrial structure in the early industrialization phases in Italy which limited the opportunity of outsourcing. This caused Fiat's operations to be integrated, especially those related to

'strategical' components. At the same time, Fiat turned to foreign specialists, with specific know-how, which have moved some operations in Italy closer to Fiat.

A great number of small firms have also sprouted up to work as Fiat's subcontractors of simple components. These are technologically, financially and market dependent on Fiat.

The Fiat-owned components production has progressively become more autonomous with respect to the Group's automobile production, both in terms of corporate structure and market dependency.

Magneti Marelli and Teksid, the two automotive component affiliated companies of the Fiat Group, are considerably oriented towards international markets, though preserving their role in Fiat's auto system.

Fiat's supply reorganization strategy, carried out since the 1980s, caused a rise in the relative volume of outsourcing as well as the reduction of the number of suppliers. Some figures highlight these changes: the value of components purchased as a proportion of the total cost of the car was 62% in 1987, 65% in 1992 and will reach 70% in 1997.

In addition, the importance of the Fiat-owned suppliers is assessed by the captive proportion of supplies: 22.5% of the total in 1987, 27.6% in 1992 and 24.2% in 1997.

Fiat still directly manufactures a few parts, representing core competence, for the following reasons:

(a) for the strategic characterization/qualification of some parts, such as bodywork and pressed parts;
(b) the high investment in some areas made in the past by Fiat (sunk costs);
(c) the relevant financial resources required by the development and production of some components.

The reduction of the number of suppliers was significant, from 1,200 in 1987 to 380 now. This also reflects qualitative changes in the relationship with suppliers. This relationship is no longer based on price and quality, but on service and time to market.

An important indicator of the qualitative changes is the degree of design activity carried out by suppliers. In the 'Uno' model case (1983), 30% of components design was carried out by suppliers: a figure which rose to 45% for the 'Punto' (1994), and to 55% for 'Brava' and 'Bravo' (1995). So the proportion of the supplies manufactured according to the carmaker design is rapidly decreasing.

The suppliers have to grow both technically and economically, to be able to develop and manufacture large series of complex components (often entire systems). To achieve this goal, it is necessary to cut the number of manufacturers supplying the same component, towards the 'one component-one supplier' policy (particularly for complex components), so as to allow for higher volumes and economies of scale.

To shorten the time to market and to satisfy the consumers' taste makes it preferable to attribute an entire system to a single supplier (for instance, all the components in the air-conditioning system, although they are assembled at different times in the assembly line). This aspect highlights the changes occurring in working practices: from a functional method at the beginning, and matrix afterwards, to 'integrated' methods, through the creation of an organizational structure called 'Piattaforma' (platform), as a unit in which the different capacities interact for a common project. The 'Piattaforma' of Fiat and that of the suppliers work in close relationship.

In addition, the tasks performed by the 'Piattaforma' are increasingly extended from a single model to a whole segment, so as to exploit synergies, and along the life of the product (from concept to scrapping), to reach a higher level of effectiveness.

In 1991, Fiat started a selection and empowerment of their suppliers network programme through the so-called 'crescita guidata' (assisted growth), in view of the launch of the 'Punto'. The 'Project 15' (May 1991) was based on the collaboration between Fiat and a set of selected suppliers with satisfactory levels of competitiveness to identify the wastes hidden in operations (in products, industrial and financial management) in order to cut costs by 15%, through standardization, cost of non-quality control, warehousing and weight of components reduction. As a result of this action, long-term contracts with component suppliers were developed for the whole of the model life.

Both the unique supplier policy and the long-term contracts allow for a lasting and strong relationship between the car maker and the supplier (who becomes a 'partner', according to Fiat's terminology).

In addition to the above performances in terms of time to market, market responsiveness, quality and costs, the reorganization of the supply base gave rise to sizeable savings in the Purchasing Department of Fiat, through the elimination of a few functions, such as market research or inspection, as well as the displacement by the suppliers of quality control (all the suppliers work according to 'self-certification', so that components could be directly addressed the assembly line, and assure homologation of the system when required).

The integration with suppliers has important consequences as regards the location of suppliers because of the need for just-in-time supplies. So the displacement of production towards southern regions of Italy has generated a significant relocation of many suppliers to this area.

The adoption of more sophisticated just-in-time system, the so-called 'kanban synchronous' (according to which the orders are sent to the suppliers when the car is at a certain point in the assembly line and the components must be delivered a few hours later when that car will be positioned at the appropriate point along the line) requires a close physical relation between car maker and supplier plants. At Melfi, 16 suppliers are located within the plant site and the external supplies will be managed by 'kanban synchronous', which total 80% of the whole supply.

The proximity of suppliers also will be of interest through the launch of the 'Palio' world car which will be manufactured in many countries. As happened in the previous internationalization experiences of Fiat (Brazil, Poland), the following solutions will be adopted (the first being the preferred one):

(a) turning to suppliers which assure different productive allocations within their partnership relation;
(b) carrying out joint ventures with existing local manufacturers (when a partnership relation can be built up);
(c) licensing local manufacturers with appropriate quality standards.

S.6.2. Examples of changes in cross-border sourcing

The trends described above show a geographical concentration of components suppliers; a rise in cross-border sourcing therefore does not seem likely.

However, one must keep in mind that this trend applies to the more complex components, which represent the larger proportion of total supplies, but not all of them. Specific types of supply could be subject to a higher degree of freedom as to location choices.

S.6.3. Effect of exchange rates on sourcing decisions

While evaluating the effects of exchange rate fluctuations on sourcing flows one must consider that:

(a) the relationship with suppliers tends to be long-standing (partnerships require time to be operational);
(b) the degree of freedom afforded by a multi-supplier sourcing system is considerably reduced with a single supplier (for each component) system: the latter can be risky for both partners;
(c) just-in-time methods generate new spatial constraints.

The currency fluctuations have made the suppliers located in Italy the preferred choice, but this trend was established a long time ago.

The weaker lira may have caused the renegotiation of price conditions with suppliers located in hard currency countries. It has also caused a reallocation of the supplies in more favourable locations within the suppliers' plants (in the case of multi-country suppliers).

S.6.4. Views on, and examples of, the internationalization of supply base

As stated in Section S.6.2, there is not much evidence of the internationalization of the supply base through cross-border sourcing. However, there is some evidence of a process of internationalization of the supply base with respect to ownership.

During the second half of the 1980s, the main components makers became more concentrated through Europe-wide takeovers. This phenomenon has involved several Italian independent component makers as objects of takeovers by foreign companies in the first half of the 1990s. Thus, while the supply base remains national, the decisional centres were shifted abroad.

S.6.5. Effect of the single market programme on these changes

The single market is likely to have had limited effects on the changes outlined above. However, it did play a role in fostering the concentration process in the components industry.

In addition, the single market has substantially affected the road haulage sector (as to transnational haulage), stimulating the competition and lowering prices: however, these changes did not have any heavy influence on the cost and the reallocation of the component suppliers because of the above-mentioned rigidities in changing the supply base, and because of the inadequate European transport system, which is a major obstacle to the cross-border just-in-time supplying.

However, the single market fostered some initiatives throughout Europe, such as the agreement among car makers' and component manufacturers' associations of France, Germany and Italy to harmonize their suppliers' quality certification systems, producing a common quality manual, building a more integrated auto parts industry in Europe.

S.7. Research, design and development

S.7.1. Location of RD&D across Europe over time

Fiat Auto RD&D activity is essentially run in Italy.

In addition to the various Fiat Departments involved in the design of new models, the main research unit is the Research Centre of Orbassano (Torino), which employed 781 people in 1994.

As to Iveco, the widespread production operations throughout Europe imply, besides the creation of the 'Piattaforma' in Italy for the development of a new product, the redevelopment in the various Business Units in Europe for the adaptation of the models according to the production specialization patterns (Germany and Spain for heavy trucks, France, Italy and Spain for light and Italy and the UK for medium trucks).

S.7.2. Estimation of cost savings from the whole vehicle and component type approval measures

The implementation of the new European measures has not generated any savings: these could be achieved only as a consequence of the harmonization of the administrative procedures and especially those relating to the car registration.

EU directives in the homologation field, in particular Directive 70/156/EEC, have exclusively acknowledged the existing standards, which have been in force for a long time (through UNECE agreements). The recent Directive 92/53/EEC also refers to particular directives which drew on previous existing standards. Up to now Fiat has homologated one model (Fiat Coupé) according to the new Directive. This experience pointed out that European homologation only set the technical but not the administrative requirements. The technical standards were already in force and they were well established.

Homologation procedures require a conformity control to technical standards by the officials of the Ministry of Transport. It is worth noting that Fiat never uses prototypes and, for this reason, the cost savings are negligible.

The new European procedure has caused limited savings because new car models do not have to be presented to foreign administrations. However, the bulk of work to be done, i.e. the setting of the technical documentation, has not declined. This is because the technical

documentation submitted to the national administration for homologation continues to be based on the existing separate directives.

In addition, supplementary documentation is still country-specific, since each administration adopts different criteria in order to register the car. The true problem therefore lies with the car registration rules which differ widely from one country to another.

At the same time, the new rules do not have an effect on the number of variants: excluding the growing number of variants due to the car makers' market differentiation strategies, the high number of variants depends on the specific requirements of each country's administration (which are still not harmonized).

These are the consequence of the existing difference in European fiscal policies, and, in particular, the parameters on which taxation is based (for instance, in Austria taxation is based on fuel consumption calculated through technical parameters and in France another criteria is used based on fuel consumption).

On the same subject, the emergence of different taxation conditions is also greatly determined by the insurance companies' policies: for instance, in Germany Fiat has to homologate a model version with a de-powered engine to meet the local insurance criteria.

Taxation and insurance practices have a great impact on the market segmentation in the different countries, and are instrumental in possible protectionist actions.

Prospectively, EU development as to car registration regulation is likely to adopt a 'cumulative' approach instead of a 'selective' one: there will be a negative tendency towards the accumulation of all the national rules into the new European vehicle circulation document rather than their selection and homogenization.

For components, the technical harmonization and the new type approval rules have little effect on the number of variants to be homologated, since they are generally specifically conceived to satisfy a single model and thus are not very suitable for standardization.

As a consequence of the above conditions, no savings in costs (and in resources involved) could be obtained by Fiat's Homologation Department.

S.7.3. Changes in patent policy

In the patent case the harmonization at a European scale has affected the technical contents, but not the administrative paperwork, with little savings and streamlining of procedures.

The establishment of the European Patent (1973) has unified the technical procedures (through the submission to a single Patent Office) but has left substantially unchanged the administrative management in each country: it is still necessary to pay the appropriate tax as well as the costs of consultants' services in each country (e.g. for the translation of the appropriate documentation).

The costs involved (up to LIT 30 million for each patent) make it very difficult, particularly for a small component manufacturer, to adopt an effective policy of patent umbrella to protect the investments.

As to non-technical components (e.g. body panels, bumpers, lights, etc.), the proposals of revision of the European industrial design regulations give a three-year cover rather than 15 years. Fiat considers that this would increase competition, probably lowering prices to the detriment of quality and safety of the spare parts, while discouraging the OE manufacturers' investments. Low quality component manufacturers and insurance companies will be the only beneficiaries of these measures.

S.7.4. Key changes taking place in RD&D

Design operations have been reorganized with the aim of reaching more flexibility in new models and a reduction of time to market. The ability to conceive the exact products' characteristics which are demanded by consumers and the timeliness in carrying out RD&D are the key factors which preserve (or improve) market share.

Fiat has managed this through specific organizational units, called the 'Piattaforma', designed for integrated work, rather than relying on a functional organization. The Piattaforma is established at the model and/or segment level and implies parallel engineering work of many company centres involved in the design, such as the Style Department and the Technical Department, improving common working. This organization model includes the relationship with component suppliers (the Piattaforma of Fiat and that of the supplier work together in an integrated manner) but also external stylists and equipment producers. In addition, great care has been applied to standardization intended as an ability to readopt solutions and components previously adopted and which have proved to be reliable.

There is evidence of the good performances obtained through these methods: between 1993 and 1996 Fiat launched 18 new models, thus renewing its range of models; time to market dropped from 67 months during the 1980s to 32 months for the latest models: the target is 24 months; and product quality has significantly increased.

S.7.5. Effect of the single market on these changes

The single market does not seem to have had an effect on these changes. The effects of the regulations on homologation are still limited. The degree of collaboration among car makers is still small.

Fiat participates in various research initiatives at European level, though they are mainly focused on pre-competitive research. As regards Italian initiatives, Fiat undertook an agreement with the government (1994) concerning the development programmes in the field of alternative drive systems.

On the contrary, in the case of industrial vehicles, collaboration is quite developed, particularly owing to the low volumes of production with respect to the costs of the new models' development. The differentiation of some product characteristics (engines, transmissions) is of a lesser importance because of the specific use of commercial vehicles as investment goods and since the product 'personalization' is carried out by other functional characteristics. However, the single market had only a small specific impact in bringing about those strategies.

In general, the main changes in RD&D do not seem to be caused primarily by the single market.

S.8. Employment

S.8.1. Changes in employment levels

Between 1990 and 1994 the employment of Fiat decreased by about 10%: however, in Italy it decreased by nearly 30% whereas employment in extra-European sites has risen significantly (also as a consequence of Polish investment). This cut in payrolls is different from those experienced previously, when only blue collar jobs were cut: it involved both blue and white collar workers. A similar trend is affecting the commercial vehicles sector, where a fall of 30% in employment occurred between 1990 and 1994.

The fall in employment was primarily carried out by turnover management (only partial replacement was enacted).

However, the whole reorganization within Fiat had to be carried out in a short time and in the middle of a recession. In this condition, in addition to the ordinary social shock absorber (Redundancy Fund) Fiat could resort to the 'Crisis Status of the Sector Declaration' by the Ministry of Labour (June 1993) which offered Fiat some facilitations for the out-displacement (or displacement within the different sites) of the excess workers. Fiat's plan with the trade unions and the government involved 16,000 lay-offs: 8,000 at Torino, 4,000 at Arese (Milano) and 1,000 at Napoli, in addition to 3,000 white collar workers mostly from Torino Headquarters.

At the beginning of 1994, an agreement was signed among Fiat, trade unions and government involving the reduction in working hours for 3,400 workers, early retirement for 6,500 and mobility within the Fiat Group for 2,000, in addition to the use of the Special Redundancy Fund for a further 4,100.

The agreement committed the government to environmental projects in the automobile sector to be carried out at the two plants of Arese and Pomigliano.

However, the subsequent upturn of the market a few months later (and the launch of the 'Punto') made part of the planned lay-offs unnecessary.

S.8.2. Changes in conditions of employment

Fiat's shake-up plan involves significant changes in human resources management. In the new plants, innovative contractual conditions have been put into practice. They represent a reference for the other plants of the Group.

They should obtain greater flexibility in the production organization and more co-operation from the workers.

The agreements introduce a scheme based on three daily shifts, six days a week, eight hours per shift (for three consecutive weeks, the fourth implying only three working days); the workflow in the lines can be stopped to solve quality problems; the working times can be redetermined every three years.

A productivity reward system has been put into effect. In addition, a special trade union-management commission is in charge to prevent and solve conflicts, safety problems, to

monitor the determination of the productivity reward system: the focus is on more collaborative relationships within the company.

S.8.3. Effect of the single market programme on employment levels and conditions

The changes which occurred in the human resources management in Fiat cannot be pinned down to the single market programme. Rather, they seem to be the effect of the growing competition in the European car market and of the prevailing conditions of the labour market and labour relations in Italy.

There is no evidence of an increase in cross-border recruitment.

S.9. Business strategy

The previous overview shows that the European market is actually considered a domestic market by Fiat, which is now focusing on the emerging markets of developing countries. Nevertheless, the strengthening of the position on the European market is an essential objective of Fiat's strategy, to be secured by gaining a bigger market share in the medium car segment.

However, it is worth noting that the Italian market will remain of great importance, being able significantly to condition the whole corporate operation.

At the same time, an effort aiming at a reduction of the break-even point has been carried out: this could be achieved through an intensive investment programme in order to innovate products, the processes and the commercial networks.

The strategies undertaken in the industrial vehicles sector are quite similar to those carried out in the automobile sector.

S.9.1. Key alliances developed and reasons therefor

There is evidence of a certain reluctance of the car makers, in general, and Fiat, in particular, to forge alliances on strategically relevant aspects, although these could appear as the correct response to increasing competition, the rise in the resources required for RD&D, the saturation and cyclical behaviour of the European market.

The preferred strategy is to reduce the break-even point (i.e. downsizing), the achievement of efficiency along the whole *filière* and internationalization looking for new and promising, though highly competitive, markets.

Alliances which have been developed are predominantly in manufacturing such as licensing agreements in areas outside the EU.

In the case of the commercial vehicles, the tough market conditions as well as the 'modularity' of products favour a greater propensity to reach development agreements in the key product areas.

S.9.2. Changes in business process strategy

Purchasing

The outsourcing of components is increasing. Above all their design is increasingly assigned to the suppliers, which tend to become 'partners' of the car makers.

The supplier is granted supply of complete systems for the whole life of the model. The relationship involves co-engineering, i.e. the collaboration between the Fiat 'Piattaforma' with the supplier 'Piattaforma' since the first model development stage (just after the concept), and co-location, depending on just-in-time methods.

Manufacturing

The Fabbrica Integrata (Integrated Factory) is an original application of the lean production systems (Japanese style) adapted to Fiat's specific firm background. It is the attempt to link together process automation with the human contribution, in order to optimize dynamically, through flexibility, control over the whole system. The production operations are integrated into a single system which starts with the customer (through the commercial network) and ends with the supplier.

The productive strategy is based on an increasing internationalization of the firm operations, mainly towards the emerging markets.

Sales and distribution

Within a 'customer pull' system the commercial network has to play a key role in the identification of product characteristics, in monitoring its responsiveness to the market expectations and enacting a follow-up of the client throughout the vehicle life. Thus, the strategies enacted have empowered the sales network mainly through the strengthening of the single dealer in the attempt to reach higher quantitative and qualitative selling standards.

RD&D

The need to reduce the time to market of the models, to enhance the parts and components standardization, to better prevent the problems which could arise in the product manufacturing and utilization phases has stimulated the creation of integrated structures, the 'Piattaforma', within which the various skills can work together. The 'Piattaformi' are set in relation to a specific model but, in effect, they extend to cover a whole segment and the whole set of problems which arise during the whole life of the vehicle (from concept to scrapping). Working methods are also being extended to component supplier relationships. It allows the time to market to be considerably shortened through the implementation of simultaneous engineering.

S.10. Views on future EU actions to help the sector

Some general considerations have to be pointed out:

(a) The European market had been substantially open for the car makers for a long time before the single market programme was established, though it has been a long process with effects felt over a long period which are difficult to assess in detail.

(b) After implementation of the single market measures, the market can still be defined as 'open' but not truly characterized by common rules ('open' but not 'single').
(c) This is partly due to the persisting cultural diversities among Member States (from this point of view the national systems will continue to exist).
(d) In this context national specificities and their regulations have weighted on past strategies and will condition the future ones (the relevance of the 'country-system').

Throughout the case study Fiat made comments and suggestions on the policies for the single market to be undertaken in the future. They can be summarized as follows:

From a general point of view a more active infrastructure policy at European level is deemed necessary to allow for a smoother mobility of goods.

The need for a stronger promotion of European technical standards towards the emerging economies.

It is stressed that the harmonization throughout Europe is progressing too slowly and is not transparent enough, sometimes making some national regulations prevail upon EU regulation. In this respect, the harmonization could be better achieved through a 'voluntary' approach, instead of a 'command-control' one. This latter approach would save the profitability of the car makers' past investments and allow for a better planning of future ones. This seems to have been the case with the environmental regulations on emissions which gave advantage to some producers with respect to others. In addition, the new emissions standards are being set with too narrow timing making it difficult to implement the investment required.

In the future, the harmonization will be harder to achieve, owing to the unanimity criteria, because of the resistance of member countries and the new members' inclusion into the EU.

Since the Maastricht Agreement requires new directives to be submitted to Parliament, a conflict could arise between the technical progress and the slow pace of updating regulations.

Of great importance is the incomplete fiscal harmonization which fragments the European markets, forcing the car makers to adopt different segmentation policies at national level.

The continuing diversities as to the fiscal burden prevent car registration harmonization, thus making the savings in the homologation operations impossible to achieve.

The public procurement deregulation asks for administrative procedures in the different countries to be harmonized in order to become effective.

The intellectual property protection is also subject to substantial administrative complexities and duplications which make substantial costs for the firm.

For the non-technical components the protection is bound to be diminished: this would hit the OE producers' investment effort, reducing the quality of products to the detriment of the consumers.

The selective distribution innovations, giving a greater power to the franchisee vendors, could be detrimental to the consumer who will be offered a deteriorating after-sales servicing.

S.11. Annex

S.11.1. List of persons interviewed

Company managers

Dott. ssa Borsero – Research and Studies (Fiat Auto)
Dott. Damini – EU Legislation (Fiat Auto)
Dott. Pettarini – Market Studies (Fiat Auto)
Dott. Bernardi – Sales Network (Fiat Auto)
Dott. Buscaglione – Technical and Legislative Services (Homologation) (Fiat Auto)
Ing. Degiorgis – Technical and Legislative Services (Patents) (Fiat Auto)
Ing. Iorio – Purchasing (Fiat Auto)
Ing. Tafuri – Purchasing (Fiat Auto)
Dott. Sordi – Strategy and Development (Fiat Iveco)

Experts

Prof. Giuseppe Volpato – Dipartimento di Economia e Direzione Aziendale, Università di Venezia
Dott. Aldo Enrietti – Dipartimento di Economia, Università di Torino

S.11.2. Articles/other information used

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Press clippings *(Mondo Economico, Il Sole 24 Ore).*

APPENDIX T

Case study on Renault

T.1. Introduction

The following is a report on our case study with Renault. The case study was carried out through an interview process with Jean-Marc Lepeu, Director of External Relations, Jean-François de Andria, Director of Planning, and Philippe Haag, Chargé de Mission.

T.2. Background to the company

Renault is split into four main divisions. The following table shows the percentage split of the workforce between these divisions:

Division	% workforce
Manufacturing	54
Marketing	21
Resources/Services	8
RD&D	17

Source: Renault.

Renault produces passenger cars ranging from the Renault Twingo to the Renault Espace and industrial vehicles (Renault V.I.) through two branches of its business – Branche Europe and Mack Trucks.

T.2.1. Geographic markets

Renault has three major markets – Western Europe, North America and Asia Pacific. However, Renault has a presence in South America, the former Soviet states, China, Central Europe and Africa.

T.2.2. Number and location of plants

Renault's passenger car activities in the EU are dominated by France where there are 20 plants producing vehicles, components and engines and carrying out RD&D activities. Renault prefers to keep the plant numbers high with a medium capacity in these plants compared to its competitors, because the smaller plants allow greater flexibility in the production process. Renault's remaining EU operations are three passenger car plants in Spain, two in Portugal, one in Belgium and one in Italy. In addition to these plants, Renault has four plants in South America – Argentina, Colombia, Venezuela and Uruguay – one plant each in Turkey, Mexico and Morocco and four plants in South-East Asia – Taiwan, Thailand, Malaysia and China. The Thailand operation is a joint venture with Volvo. All these non-European plants are passenger car manufacturers, except the Mexico plant which produces engines. On the commercial vehicle side, Renault V.I. has six plants in France, and one plant each in Spain, Morocco and

the UK. Mack Trucks has three plants in the USA and one each in Australia, New Zealand and Venezuela.

T.2.3. Trends in production

In 1985 total passenger car production was 1.6 million vehicles. Production rose steadily to a peak of 1.93 million in 1989. Since then, production has fluctuated around 1.8 million per annum. For commercial vehicles, Renault V.I. produced 66,482 vehicles in 1990. This figure declined to 47,863 in 1993 but recovered to 64,415 in 1994. It is clear that production is greatly affected by the recent recession and has only recently appeared to recover.

T.3. Effects of the single market programme on market access

Renault did not wait until the implementation of the single market programme before it treated Europe as a common single market. Renault established a Common Market division in 1961 and views the single market programme as a formalization of the Common Market.

T.3.1. How sales outside the national market have changed over time and the reasons for this

Historically, Renault has had a strong consumer base in the south of Europe – Italy, Spain and Portugal. This was partly due to production agreements with companies in these countries, such as with Alfa Romeo in the 1960s, as well as the location of Renault plants in Spain and Portugal. However, over the last ten years, Renault has pursued a policy of balancing its sales in the north and the south of Europe. This was as a result of consumer demand changing in these Member States partly because of an increase in the level of competition faced by Renault in these markets. In order to become less exposed to the fluctuations in demand in these Member States and to the intense competition, Renault have sought a more balanced sales strategy for the whole of Europe. Throughout all this change, however, the domestic market is still the most important to Renault – over 30% of its global sales in 1993 were in France.

T.3.2. Launch of new models for the whole European market and the reasons behind this

Renault considers that there is more commonality among the different producers' products over the last ten years. For example, there are fewer specific concepts such as the 2CV or the R4. However, the models are not viewed as being any more 'European' today than they were 30 years ago. Thirty years ago, Renault were producing a world car, the Dauphine which had the same output as the Clio today. What has changed is the level of competition which has resulted in an increase in the number of models in each model class. In the 1950s there was usually only one model by class. Now there are usually four models in each class of car (coupe, hatchback, estate and saloon). This has resulted in a decrease in share for each model as they become increasingly differentiated. As a consequence, instead of becoming more European, many manufacturers sell their products based on their national characteristics – the 'Frenchness' of the Clio or the Germanic efficiency of the Audi.

For these reasons, Renault consider that the increase in models and variants is more a reflection of the long-term increase of global competition in the automotive industry than the single market programme increasing the competition and variety available to the consumer. Global competitive increases are more to do with the Common Market, a natural progression to develop sales in new markets and overcapacity world-wide. This, in turn has led to a more

sophisticated consumer who demands more from the automotive manufacturers. This has also led to an increase in competition.

T.3.3. Relative effects of recession and exchange rates on the levels of access to other European markets

Renault, like the rest of the automotive industry was caught out by the depth and length of the recent recession. This is one of the main contributors to the increased overcapacity in the industry which has led to an increase in the level of competition. Renault considers that the recent recession has been made worse by the single market programme through over-regulation, such as emission limits, airbags and other safety requirements. Renault considers that the European Commission has forced the automobile industry to apply the most advanced technological equipment regardless of the need. This means that the purchasing power of the consumer has been outstripped by the increase in costs of meeting these regulations. This has had a big impact on the market, because consumers are buying less cars and retaining their existing cars for longer or even looking more at the second-hand market.

Renault is most concerned with the fact that although the single market programme was implemented, there is not an internal market in currency. In 1992 when there was a devaluation in the pound, lira and peseta, Renault estimates that it lost FF 4 billion. This occurred through the desire of Renault to maintain market presence but also wanting to limit the loss in profits. Through this balancing act between market share and profit, Renault has had to accept a reduction in its margins greater than the loss in market share. The expectation was that over time, inflation in these countries would lessen the impact of the devaluation on Renault's business. However, this has not proved to be the case.

Currency fluctuations have also given rise to a new problem for Renault. Parallel importers have been impairing the business of their distribution network. In Renault's view, the Commission has been wrong in liberalizing the flow of products in Europe before creating a single European currency. The fluctuations in currency across the single market make it very difficult for the European automotive manufacturers to plan for the long term. However, the fluctuations in currency mean that there is an increased incentive for these manufacturers to set up plants in countries other than their national markets. The presence of long-term cheaper currencies means that many companies are locating their plants in the UK, Spain and Portugal.

T.3.4. Implications of different tax regimes for market access

Renault considers that no progress has been made on the creation of a single tax regime in Europe. Despite the fact that VAT is paid in the country where the car is bought, where there are severe distortions in the tax regime, problems arise. In Denmark, for example, where the purchase tax is nearly 100%, there is a strong pressure on the manufacturers to push the pre-tax price down or face no market. This, in turn, has a consequence on the price that the manufacturers can charge in the other countries of the EU. Renault believes that the differences in tax legislation based on requirements for insurance and the size of engines add to its production costs because it has to produce different variants for different countries. Renault estimates that of the 80 variants it builds for one model, approximately 20% of these variants are because of tax differences. The equivalent cost of these differences is FF 20 million.

T.3.5. Introduction of pan-European marketing and distribution networks and the effect of the block exemption

Renault said that although the block exemption was renewed, it is not clear what basis the Commission used for this renewal. This means that the incentive for future investment has been affected. Renault does not consider that the Commission has the right balance between the consumer, manufacturer and dealer. When Renault surveyed consumers, it found that dealerships were preferred for servicing and sales.

Renault does not consider that pan-European marketing is possible even though it produces European cars. Pan-European marketing is difficult because of differences in consumers across Europe. For example, the people carrier market takes on greater importance in some countries than in others, the Megane is a car for Europe but cannot be marketed in the same way in the UK as in Italy. Any pan-European marketing campaign often ends up as the lowest common denominator, appealing to no one.

T.4. Changes in production costs and productivity

Renault considers that the single market programme has not resulted in the principal effect on production costs and productivity. Any recent changes in productivity are because of the globalization of competition in the automotive industry. The increased competition has increased productivity and Renault would have made these improvements whether the single market programme was implemented or not. The single market was at most a contributing factor to these improvements but the main driver of improvements in productivity was growing globalization.

T.4.1. New methods of working

All new methods of working came from the growing Japanese threats in the 1970s. At this point, all European manufacturers went over to Japan to learn the new methods. However, the implementation of these new methods took around 10 years, because it was not only the minds which needed to be changed, but also the plants to accommodate these changes. In the 1970s and 1980s, the European automotive manufacturers made a huge effort on quality. This was more in response to the Japanese than in preparation for the single market programme. This is reflected by the fact that the number of customer complaints between 1989 and 1996 have fallen by 75%.

T.5. Employment

T.5.1. Changes in employment levels

There has been a significant decline in employment – as a direct result of productivity improvements made over recent years. Renault regards the role of the single market in this fall in employment and increased productivity as minimal at most.

T.5.2. Changes in conditions of employment

The conditions of employment have changed with the Social Chapter. Employment conditions have also changed as a direct result of recent improvements in plant, such as new production techniques, changes in the level of automation and new automation.

T.5.3. Degree of cross-border recruitment

There has been little cross-border recruitment. Plants located in France generally employ French people and plants located in Spain generally employ Spanish people. Mobility of the labour force has remained unchanged because country-specific social laws, pensions, taxes and salaries are all perceived as barriers to mobility. Renault has, however, increased the mobility of their labour force at a senior level for world-wide purposes. For example, three years ago, the General Manager of the Spanish operation was French, now the General Manager is Spanish. Furthermore, the head of Renault's Parts and Service Division is Spanish.

T.5.4. The effect of the single market programme on employment levels and conditions

Renault feels that there is still a long way to go before the single market programme has a direct effect on the employment levels in the automotive industry. Renault consider that the single market programme has had an effect on working conditions in the automotive industry through the Social Chapter.

T.6. Manufacturing plants

T.6.1. Overview of the location and size of plants over time

Renault tends to have relatively small plants in comparison to US companies. The reason for this is that Renault feels that scale economies are not the sole determinant of the correct size for a plant. Renault considers that the smaller plant gives it the flexibility it needs in an increasingly competitive market. Renault's plants have traditionally been based in France and the south of Europe, where the main markets for their products are located. However, as noted above, the market for Renault products has changed from being predominantly based in the south of Europe to the north of Europe. This means that the French plants are ideally placed to serve these new markets but that the Portuguese and Spanish plants are no longer so ideal.

Despite these changes in demand for the Renault product, Renault does not consider that the single market programme has played a part in the decision for the location of its plants.

T.6.2. Reasons behind international relocations

Renault considers that there is a tendency to relocate plants where the currency is cheaper. This has been confirmed by the location decisions of Nissan to build plant in Spain and the UK.

As noted above, as Renault's sales patterns have changed from the south of Europe to the north, Renault has relocated some of its plants. For example, a plant in Portugal, originally located there to supply that market, has been closed because it is not in the right position to supply the changing Renault market. Nevertheless, Renault considers that the single market will affect the future decisions for the location of plants because of the removal of barriers to entry across Europe. Despite this, Renault notes that new entrants to the European market are now more likely to locate in Eastern Europe because of the free trade agreements with these states and the greater currency stability. Renault would also relocate to this area if it were to build a new plant, because of the advantageous salary levels and free trade agreements.

T.6.3. Production patterns within plants

Generally, Renault does not want more than two plants for one of its products. However, this strategy far outlives the implementation of the single market programme.

T.7. Purchasing

T.7.1. Numbers of suppliers used and their location over time

In 1989, Renault dealt with 1,163 component suppliers. By 1995, this had fallen to 843, i.e. by 27.5%. This reduction is more a reflection of a development of 'system suppliers', those suppliers that take on a component system for manufacture and pass it on to the automotive manufacturer, than as a direct result of the single market programme. This means that Renault now has less direct relations with as many automotive component suppliers, even if many are still involved in the automotive component manufacture process. The location of suppliers used has not been affected by the single market programme. Many of the contracts that Renault has with its suppliers are long-term and based on mutual long-term understanding and trust. Certainly, Renault is buying in more by outsourcing more of their non-core production. Seventy per cent of the cost of the vehicle is now produced by component suppliers, whereas 20% of the cost of the vehicle was outsourced 20 years ago. The relationship between the component suppliers and the manufacturers has also changed, with more responsibility for the technological development of the components being placed in the hands of the component suppliers. The relationship between Renault and the suppliers has also taken on a quality assurance role so that the companies can develop together.

T.7.2. Examples of changes in cross-border sourcing

Because of this changing relationship, the contracts between the suppliers and Renault have become more long-term. This has actually reduced the degree of cross-border sourcing because fewer firms and products are involved in the process of supplying the systems to the manufacturers. Renault considers that the single market has not played a part in this process. The dominant factor in the reduction in cross-border sourcing is the increase in global competition.

T.7.3. Changes in intra-firm sourcing

Given that there are fewer components made by Renault, the degree of intra-firm sourcing has fallen.

T.7.4. Effect of exchange rates on sourcing decisions

Renault tends to buy as much as it sells in a country so that the exchange rate fluctuations of recent years are neutralized. Well before the single market programme was implemented, Renault had begun a rationalization of their component supply base. Part of this strategy was based on the recent fluctuations in exchange rates rather than the single market programme.

T.7.5. Views on, and examples of, the internationalization of supply base

The single market is regarded to have had an effect on the component supply base. The single market has created supply scale economy opportunities and this has attracted the investors from abroad – particularly the US, Japanese and Korean component manufacturers.

T.7.6. Effect of the single market programme on these changes

Renault considers that sourcing depends on 'Quality, technology and cost, not the single market'.

The main factor in the use of component suppliers has been a strategy of partnership against a strategy of balancing the impact of currencies.

T.8. Research, design and development

T.8.1. Location of RD&D across Europe

Renault considers that the single market programme allows RD&D to be located in one place. Before the single market programme was implemented, Renault had been pursuing a policy of centralizing RD&D in France through the closure of some small RD&D operations in Spain. Renault is currently building a new RD&D plant in France for 6,000 staff.

T.8.2. Estimation of cost savings from the component type approval measures

Renault considers all type approval savings in terms of the whole vehicle.

T.8.3. Estimation of cost savings from the whole vehicle type approval measure

Renault considers that the single market programme has had a significant positive effect through whole vehicle type approval. The savings have been reflected through reductions in the number of hours worked by engineers, a reduction in administration, reduction in time for selling products in various markets and fewer product differences across the Member States of the EU. Despite the positive effect of the whole vehicle type approval measures of the single market programme, the impact on Renault's business is minimal. Renault estimates that the cost savings from whole vehicle type approval are less than 1% of the 'entry ticket' (from development to production of a new vehicle). The Megane cost approximately FF 8 billion, and the savings from whole vehicle type approval were much less than FF 80 million.

Renault considers that the costs imposed through over-regulation have outweighed the cost benefits of whole vehicle type approval. Moreover, despite the whole vehicle type approval's reduction in the numbers of model variants required across the Member States, increased competition over recent years has increased pressure on automotive manufacturers to produce a wider range of variants for one model.

T.8.4. Degree of European and global intra-firm collaboration in RD&D

Renault has a clear policy to co-operate with other manufacturers and component suppliers wherever it can because of the advantages that this brings to its business. For example, they often co-operate with other manufacturers on the development of new, technologically sophisticated components. This is partly because of cost savings in development but also results in suppliers of the new components being able to exploit economies of scale through larger orders than would occur if only Renault had developed the component. Renault does not consider this policy to be a result of the single market programme, although it has been a small contributory factor. The main reason for this policy is increasingly globalized competition.

T.8.5. Key changes taking place in RD&D (particularly joint design with suppliers)

As noted above, Renault has changed its policy of dealing with the component suppliers and other manufacturers regarding RD&D. More responsibility for product development is placed in the hands of the component suppliers. More collaborative RD&D with other manufacturers is also taking place, as the globalization of competition in the industry increases the pressure to lower costs.

T.8.6. Effect of the single market programme on these changes

The single market has had a fairly muted effect. The impact of the whole vehicle type approval measures has had a significant effect but this has been countered by what Renault regards as over-regulation as well as increasing competition. The centralization of Renault's RD&D plant has been facilitated to a small extent by the single market programme. The degree of global and intra-firm collaboration in RD&D has increased over recent years although this is mainly because of the increase in global competition.

T.9. Business strategy

The following table shows the key alliances Renault has developed over the last 30 years:

Who with	Date	Activity
Peugeot	1966	engines
Peugeot	1966	automatic transmissions
Peugeot	1970	utility vehicles
Matra	1983	the 'Espace'
VW	1983	R&D into automatic vehicles
Toyota	1990	4x4 vehicle
Volvo	1990	components
Heuliez	1992	autocars and autobuses
ABB Robotics	1993	flexible assembly systems
Karosa	1993	autocars and autobuses
John Deere	1994	tractors
Massey Ferguson	1994	R&D into transmissions
Iveco	1994	R&D

Source: Renault.

Business strategy has been covered in detail in the previous sections. However, Renault considers that the single market has not had a significant direct effect on any of the areas of its business. However, Renault considers that the strategy of the firm has been indirectly affected by the single market programme in one area. Renault believes that the single market has been of greatest benefit to new entrants into the EU automotive market, particularly the Japanese and Korean firms. This has further increased the competitive pressure on the European-based automotive manufacturers who have had to adjust their strategies accordingly through closer links with the component suppliers, many of whom are owned by 'foreign' companies, and greater collaboration in the development and production of vehicles.

T.10. Views on future EU actions to help the sector

Renault is concerned at the level of Community support for publicly funded research programmes. Currently, the EU is falling well short of the support provided for the US automotive industry. Renault considers that the EC could be used as an engine for co-operation, but that this is not yet the case.

Renault would like to see true implementation of the single market through the equalization of social laws, subsidies and currencies. For example, in 1992, when the EC put together its deal with Japan on the Elements of Consensus, the EC established a set of measures required from the Commission and the national governments of the EU to support the automotive industry during the transition to a truly open market in 1999. These measures were a list of issues setting out the distribution of tax rates, stability in the industry and design protection, amongst others. In 1996, very few of these measures have been achieved, and there are only three years remaining to carry them out. Renault considers that the Commission has never been able to develop a horizontal industrial policy towards the automotive industry, so the Commission had replaced what it could not achieve with a policy that it could – a customer-oriented policy. Of the 15 Member States Renault considers that there are five 'producing' countries and 10 'commercial service' countries in the automotive industry. Renault considers that the Commission has opted for the majority policy of helping the 10 service Member States because of its easier implementation. This consumer-oriented policy has therefore been at the expense of industry-oriented policy.

T.11. Annex

T.11.1. List of persons interviewed

Jean-Marc Lepeu, Director of Exterior Relations
Jean-François de Andria, Director of Planning
Philippe Haag, Chargé de Mission

T.11.2. Articles/other information used

Renault Annual Report, 1994.
Renault Economic Atlas, 1995.

APPENDIX U

Case study on Daewoo

U.1. Introduction

Daewoo is one of the largest of the South Korean chaebol companies. It was formed in 1967 as a textile and clothing exporter. Its total group turnover in 1995 exceeded US$ 57 billion from 22 companies, of which the automotive interest is but one.

Daewoo appears to be following an aggressive expansion strategy at the moment, along with the other Korean vehicle producers. Its vehicle interests date back to 1978, when Daewoo took a stake in Saehan Motor Co. Ltd, set up as a joint venture between General Motors and Shinjin Motor Co. Ltd in 1972. The company was renamed Daewoo Motor Company in 1983. The links with GM were severed in 1992 at the instigation of the Koreans, leaving Daewoo Motor with an increasingly dated range of GM cars and limited product development expertise. However, from 1995 it allows Daewoo free access to any markets it wants.

As a result it has launched in Western Europe during 1995, as well as broadening its activities in Romania and Latin America. Daewoo has retained its link with Volvo Truck under which it assembles heavy Volvo F12 trucks in Korea. In the UK, Daewoo has taken over the prestigious IAD design and engineering consultancy, providing it not only with a European listening post, but with a ready-made European-trained product development team of 415 running a department equal in size to Daewoo's existing studio in Seoul, but of the highest quality and with a world-wide reputation. This has helped in speeding up the acquisition of in-house expertise. Daewoo's first in-house models will start appearing from 1997. A significant move in terms of Daewoo's Europeanization was the appointment of Ulrich Bez as vice-president for engineering and development[13]. Bez was involved in a senior product development capacity first at BMW and subsequently at Porsche. Another key appointment is that of ex-Ford man Ray Everts, who was involved in Ford's Escort, Sierra, Granada and Taurus programmes. Daewoo is expected to invest US$ 3.7 billion by the year 2000 on new plant, new models and related projects, such as vehicle testing facilities.

U.2. Daewoo and the Korean automotive sector

As Table U.1 shows, the expansion of capacity by Daewoo is only part of an overall picture of growth in output from Korean companies on a global basis.

[13] Feasr, R. [1994], 'The Koreans are coming', *CAR Magazine*, December 22–23.

Table U.1. Projected Daewoo capacity expansion, 1994, 2000

(000s units)

Firm	1994 capacity	2000 capacity
Hyundai	1,150	2,000
Hyundair Precision	76	
Kia	551	1,500
Asia Motors	146	
Daewoo	396	2,200
Daewoo Shipbuilding	204	
Ssang Yong	39	60
Samsung	0	40
Total	2,562	5,800

Source: ERI, 1994; CAIR estimates.
NB: Group figures. Assumes two-shift pattern and 265 working days per year. All categories of vehicle. A significant proportion of the new capacity will be outside Korea.

In the short term the majority of sales into the European Community market will be direct exports from Korea. In aggregate, exports of cars and other vehicles from Korea grew from 123,000 in 1985 to 737,000 in 1994. Daewoo contributed about 100,000 of those exports in 1994, well behind Hyundai (392,000) and Kia (210,000). In the period 1992 to 1994 inclusive, Korean exports to Western Europe as a whole grew from 109,000 to 138,000 units.

The largest single national market for Korean exported vehicles is Germany, with just under 40,000 units in 1994.

The South Korean automotive industry has followed an aggressive expansion strategy, both within Korea and in terms of developing new capacity in other locations. Table U.2 summarizes these investments outside Korea, where again Daewoo follows a pattern shown by the South Korean industry as a whole.

Table U.2. International assembly plants involving Korean firms

Firm	Country	Capacity (000s)	Date started	Comments
Hyundai	Canada	100	1989	Transplant production. Sonata
	Thailand	10	1993	Excel
	Botswana	10	1993	Elantra, Excel, Sonata
	Egypt	15	1994	Excel
	Malaysia	11	1995	1.25 tonne commercial vehicle
Kia	Taiwan	25	1989	Pride
	Philippines	15	1989	Ceres, Pride
	Venezuela	7	1992	Pride
	Vietnam	2	1993	Ceres, Pride, Besta
	Iran	100	1993	Pride
	Indonesia	50	1994	Pride, Sephia. JV 30% Kia
Daewoo	Uzbekistan	200	1995	Small car. JV 30% Daewoo
	Iran	50	1995	Lemans, Espero. JV 30% Daewoo
	Philippines	20	1994	Lemans, Espero. JV 30% Daewoo
	Vietnam	20	1994	Lemans, Espero, Prince. JV 30% Daewoo
	China	5	1994	Large bus. JV 30% Daewoo
	Romania	200,000	1994	Purchase of 51% of Olcit
	Poland	90,000	1995	61% of FSL to make Cielo sedan
	Poland	220,000	1995	70% of FSO

Table U.2. International assembly plants involving Korean firms (continued)

Firm	Country	Capacity (000s)	Date started	Comments
	Czech Republic	75,000	1995	33% share of Avia (Cvs) with Steyr of Austria
	Austria	n.a.	1995	Daewoo to take 65% share of 4 plants
	India	100,000	(by 1997)	Cielo production
	Indonesia	20,000	1995	Espero
Asia Motors	China	5	1994	Medium bus. JV 30% Asia Motor
Ssang Yong	Vietnam	2	1991	Korando

Source: KERI, 1994; Company Reports; Press.

U.3. Daewoo globalization

At group level, Daewoo has ambitious expansion targets. Its goals for the year 2000 include:

US$186 bn in sales;
430 sales subsidiaries;
130 production subsidiaries;
30 technical and design research centres;
70 local branch offices.

The total group sales targets for the year 2000 include: US$ 74 billion trade; US$ 17 billion construction; US$ 40 billion motor vehicles; US$ 18 billion heavy machinery and shipbuilding; and US$ 28 billion computers and telecommunications. The automotive segment is therefore a very important area for the group as a whole.

Group investments in overseas offices and subsidiaries will be in the region of US$ 4.6 billion between 1995 and 2000.

Table U.3. Production of vehicles by Daewoo, 1987–94

Year	Daewoo	Daewoo Ship
1987	162,225	
1988	162,788	
1989	161,925	
1990	201,035	
1991	203,792	44,251
1992	179,020	90,513
1993	300,094	75,200
1994	340,707	72,460

Source: KAMA, 1995.

By 1994 output had reached 413,000 units of all types. The group has a stated strategy of wanting to be in the world's top ten manufacturers of motor vehicles by the year 2000 – and this will entail an expansion of capacity to over two million units. The company will have a global production capacity outside Korea of 500,000 vehicles by 1996. The large plants in Uzbekistan and Romania should start production in 1996, though not at full output.

Daewoo has further sought to expand its global sales network to allow greater levels of exports. In 1995 Daewoo exports from Korea were 287,000 units, a 164% increase over 1994. Plans for 1996 include 530,000 exports, of which 138,000 would be in the form of kits. Western Europe remains the main market region destination; Daewoo has no presence as yet in North America. Daewoo have sought to target developing economies in Eastern Europe, Latin America and Asia as growth areas for both sales and inward investment. Western Europe as a whole currently accounts for about one-third of exports.

In Western Europe as a whole, the number of dealerships is expected to grow from 1,308 (1995) to 1,560 (1996) with new markets including Sweden, Denmark, Portugal and Turkey.

Daewoo has adopted an innovative distribution strategy in the UK market, but has been more traditional in other national markets within the European Community. In the UK, Daewoo has established a small network of directly owned main sales points, usually in non-traditional locations such as mixed retail parks. Daewoo has formed a link with Halfords, an independent operator of vehicle service centres in the UK, to provide service support for its vehicles. Daewoo has further sought to differentiate itself on the basis of fixed price selling, extended warranties and various other 'customer care' features. The company has succeeded in obtaining a very rapid growth in market share to about 1% of total UK sales (sales of 13,169 or 0.93% of the total market). However, in other markets where a more traditional distribution approach has been taken, Daewoo has also enjoyed success. For example, in 1995 in the Netherlands Daewoo sold 6,150 new cars to hold 1.4% of the market.

The Single Market Review

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This report has been written as part of a major review of the Single Market undertaken by the European Commission. The 1996 Single Market Review assesses the progress made in implementing the Single Market Programme since 1992, through a series of 39 separate reports on specific business sectors or single market issues. This research amounts to the first extensive analysis of what has been happening to the European economy as a result of the Single Market Programme.

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